JPRS-TND-89-023
26 DECEMBER 1989

FOREIGN
BROADCAST
INFORMATION
SERVICE

JPRS Report

Nuclear Developments

Nuclear Developments

JPRS-TND-89-023 *26 DECEMBER 1989*

CONTENTS

SPAIN

SWEDEN

Planned Sale of M-9 Missiles to Syria Alleged

Foreign Ministry Denial

OW1112105589 Beijing XINHUA in English 1035 GMT 11 Dec 89

[Text] Beijing, 11 Dec 'XINHUA)—The Chinese Foreign Ministry today dismissed a foreign press report about an alleged plan to sell medium-range missiles to Syria as "utterly groundless."

Asked by correspondents to comment on a foreign press report that China is going to sell M-9 missiles to Syria, the ministry said in a press release, "this report is utterly groundless."

"China has all along taken a serious and responsible attitude toward the sale of medium-range missiles," it said. "Except its sale of a few missiles to Saudi Arabia, China has not sold and has no plan to sell any medium-range missile to any Middle East country," it stated.

Israeli Report

TA1212090289 Jerusalem THE JERUSALEM POST in English 12 Dec 89 pp 1, 10

[Report by Kenneth Kaplan and news agencies]

[Excerpt] Syria and China have signed a contract whereby China will sell 140 M-9 missiles to Syria for some $170 million, reliable Israeli sources confirmed to THE JERUSALEM POST yesterday. The n issiles have a range of approximately 600 kilometres and could reach targets anywhere in Israel.

But China, which denied last month that it was considering such a sale, yesterday again denied the deal, and also denied that a senior U.S. delegation which arrived in China at the weekend was sent expressly to persuade China not to go through with it. [passage omitted]

Li Offers Pakistan Nuclear Plant

OW1611112889 Beijing XINHUA in English 1041 GMT 16 Nov 89

[Text] Islamabad, 16 Nov (XINHUA)—Chinese Premier Li Peng announced today that China will provide a 30000-kilowatt nuclear power plant to Pakistan.

The Chinese premier said that his talks with Pakistan Prime minister Benazir Bhutto in the last days covered the issue of nuclear energy cooperation between the two countries and an agreement was reached.

Under the agreement, China is to provide Pakistan with a 300,000-kilowatt nuclear power plant, Li, who arrived here November 14 for a four-day visit, told newsmen at the state guest house in Rawalpindi, the twin city of Islamabad.

Li said China and Pakistan have already signed an agreement for peaceful use of nuclear energy. "The supply of a nuclear power plant to Pakistan is based on the former agreement between the two countries," he noted.

The Chinese premier pointed out, "The construction of the nuclear power plant will be under the supervision of the International Organization of Peaceful Use of Nuclear Energy because both China and Pakistan are members of this organization."

Li said, "China and Pakistan have not reached any defense pact." China has provided Pakistan with military aid which is only for defensive purposes, he added.

In his opening remarks at the press conference, Li said his visit to Pakistan has been very successful.

He and his party have received a warm welcome from Pakistan's leaders and people, reflecting the deep friendship between the two countries, the Chinese premier said.

Li said he has held two rounds of talks with Bhutto and met with President Ghulam Ishaq Khan.

"China-Pakistan friendship has stood a test of time and the cooperation between the two countgwes is a model of cooperation between different systems," Li said.

He added that China and Pakistan will continue to work together to consolidate and strengthen their relations.

Li arrived on an official goodwill visit to Pakistan, the first leg of a three-nation South Asia tour which will also take him to Bangladesh and Nepal.

Pakistani Official on Reactor

OW2011180189 Beijing XINHUA in English 1510 GMT 20 Nov 89

[Text] Islamabad, 20 Nov (XINHUA)—Chairman of Atomic Energy Commission of Pakistan Munir Ahmed Khan said Monday that the 300 mega watts nuclear plant China agreed to help build in the country will be a pressurised water reactor, a type very popular in the world and guaranteed by the International Atomic Energy Agency (IAEA) for safety.

A formal agreement will be signed with China shortly for the plant's construction to commence next year and to end in 1996, he said while briefing newsmen here.

Pakistan reached an agreement with China in principle on November 15 during the visit of Chinese Premier Li Peng here, he added.

There are already 320 such reactors operating presently in the world.

Under the agreevent China will provide fuel and spares for the plant for a long time before Pakistan could become self-reliant, he further said.

"Pakistan has been desiring since long to get nuclear power plants to overcome the severe energy crisis and this is a concrete step in this regard," he pointed out.

"Another importance of the agreement is that it will pay way for South-South cooperation as a developing country will transfer technology to another developing country," he said.

Heavy Ion Accelerator Passes State Appraisal

OW1211124889 Beijing XINHUA in English 1541 GMT 10 Nov 89

[Text] Lanzhou, 10 Nov (XINHUA)—The Lanzhou Heavy Ion Accelerator, completed last December, passed an appraisal by specialists here today after having been in operation for 5,000 consecutive hours.

The high-energy accelerator, which is composed of a source accelerator, main accelerator, eight experimental terminals and back and forth beam transport lines, is the third large-scale heavy ion cyclotron in the world; the two others are in France and Japan.

The various kinds of ion beams released are to be mainly used in basic research into heavy ion nuclear physics and research into the application of heavy ion beams in various branches of physics, materials sciences, radiation biology and medicine, and in industry and agriculture.

The completion of the accelerator is another great scientific achievement made by China, following the Beijing Electron-Positron Collider which passed an appraisal in July.

Nuclear Reactor To Provide Heat for Beijing

OW1211211889 Beijing XINHUA in English 0853 GMT 11 Nov 89

[Text] A nuclear reactor was switched on today to provide central heating in Beijing, opening up a new way to use nuclear power for peaceful purposes.

Specialists said the low temperature generator reactor has double shields, is reliable and does not create pollution.

Located in Changping County, a northern suburb of the city, the reactor was designed and built by the Nuclear Energy Technology Research Institute of Qinhua University.

Heat provided by the reactor costs only three-quarters as much as heat from domestic coal.

The reactor is one of the key ingredients of China's Seventh Five-Year Plan (1986-90).

Qinshan Nuclear Power Station Project Continues

HK1511045989 Beijing ZHONGGUO XINWEN SHE in Chinese 0525 GMT 11 Nov 89

["Early Preparatory Work for the Second-Phase Project of Qinshan Nuclear Power Station Is in Progress"—ZHONGGUO XINWEN SHE headline]

[Text] Hangzhou, 11 Nov (ZHONGGUO XINWEN SHE)—While the first-phase project of the Qinshan Nuclear Power Station is nearing completion, the construction of its second-phase project is being stepped up vigorously.

The first-phase project of the Qinshan Nuclear Power Station is a 300,000-kw nuclear generating unit which was domestically designed and built and the second-phase continuation project is composed of two nuclear generating units with a capacity of 600,000 kw. China plans to take the generating unit with a capacity of 600,000 kw as the standard generating unit in its construction of nuclear power stations.

So far the contracts of the designing and services of the second-phase project have all been signed and the written opinions concerning the plan for living and auxiliary facilities have been adopted through examination and discussions. Its general design has been carried out in an overall manner.

The prospecting work of the second-phase project is currently under way. The China Nuclear Industrial General Corporation is holding negotiations with the FRG and France for import of technology and components from abroad.

Guangdong SEZ Opens Nuclear Monitoring Unit

HK2211021989 Hong Kong SOUTH CHINA MORNING POST in English 22 Nov 89 p 5

[By Andy Ho]

[Text] China has set up a nuclear safety monitoring unit in Shenzhen to help allay fears over quality control at the Sino-Hong Kong atomic power plant now under construction at Daya Bay.

The Chinese National Nuclear Safety Administration (NNSA), the official Beijing-based nuclear licensing authority, is optimistic that its Shenzhen team could help "stabilise public sentiments in Hong Kong towards the Daya Bay project".

A similar monitoring station was earlier established near Shanghai for China's first civil nuclear power plant in Qinshen, whose generating capacity will be about a third of the twin 900 megawatt pressurised water reactors to be installed at Daya Bay.

To date, the Shenzhen-based monitoring team has conducted four on-site quality inspections on the concrete foundation rafts for the two nuclear complexes.

Three further on-the-spot quality checks were carried out on the alignment and welding works for the six-millimetre-thick steel liners for the reactor containment shells.

NNSA officials told the New China News Agency in Beijing in a recent interview that both regular and sample tests were carried out and follow-up inspections conducted until the problems spotted had been resolved.

The administration said it had accorded top priority to the $28.8 billion Daya Bay scheme, the biggest ever joint venture project on the mainland.

The officials said their quality assessments and onsite inspections were conducive to timely identification and rectification of the project's "fragile aspects".

As of last month, almost 80 percent of the total civil works for the project's nuclear component had been completed.

More than 90 percent of the civil works for the conventional turbine generating section was also finished.

Following the omission of about half of the starter reinforcement bars of the first reactor complex two years ago, NNSA has not identified any major construction errors in the Daya Bay project.

Erection work for the first of the two reactors is scheduled for completion in August 1991.

Three quarters of the future Daya Bay electricity output will be transmitted to the territory through the China Light and Power Company, a 25 percent partner of the nuclear investment.

State To Build Nuclear Component Production Base

OW2311190189 Beijing XINHUA in English 1101 GMT 23 Nov 89

[Text] Chengdu, 23 Nov (XINHUA)—The State Planning Commission has ratified a project to build a large nuclear power component production base in southwest China's Sichuan Province.

The base is needed to guarantee production of the components needed in China's nuclear power plants up to the year 2000.

Advanced technologies and some equipment will be introduced from foreign countries to upgrade the Sichuan Yibin Fuel Components Factory, China's only nuclear power component factory. At present, the factory has a production line turning out components for 300,000 kw nuclear power plants.

After the upgrading the production line will be able to produce components for 600,000 kw and 900,000 kw nuclear power plants.

Nuclear Official Cites Improved Safety

OW2011180489 Beijing XINHUA in English 1433 GMT 20 Nov 89

[Text] Beijing, 20 Nov (XINHUA)—China's nuclear safety measures have been greatly improved since the government started to administer civil nuclear installations five years ago.

Addressing a national symposium on nuclear safety, which opened here today, Zhou Ping, director of the State Commission for Nuclear Safety, said a staff has been formed to administer, supervise and study the problem.

In order to use nuclear energy for peaceful purpose, he said, the commission has reviewed safety at the Qinshan Nuclear Power Plant, and made a preliminary examination of the safety measures at the Guangdong Nuclear Power Plant and issued it an operation license. It has also supervised the construction of the two power plants.

The commission has inspected the safety measures, the emergency project and the test monitor of the five-megawatt low-temperature heating reactor.

Meanwhile, regulations and technological methods for evaluating and examining nuclear safety have been formulated.

Zhou said China has set up a supporting technological staff in the field of nuclear safety. For example, the Beijing Nuclear Safety Evaluation Center, established by the commission and the No. 2 Research Institute of Nuclear Industry, has played an important role in nuclear administration and management.

China has adopted international standards since it began nuclear administration, Zhou added. Thus, its work has been widely recognized throughout the world.

China has established co-operative relations with the United Nations Development Program, the International Atomic Energy Agency, the Commission of the European Community, and some other foreign organizations. They have helped in providing expertise and training professionals to promote nuclear safety in China.

Scientists Achieve Nuclear Fusion Breakthrough

OW2711153789 Beijing XINHUA Domestic Service in Chinese 1142 GMT 25 Nov 89

[By reporter Zhang Xuequan (1728 1331 0356) and correspondent Wu Yingxi (0702 5391 3556)]

[Text] Shanghai, 25 Nov (XINHUA)—China has achieved a major breakthrough in using high-power laser equipment to carry out an experiment of inertia constrained fusion.

Named "Shenguang" [4377 0342], the laser equipment has a power output of 2 billion kilowatts. Using this equipment to conduct a comprehensive physical experiment of inertia constrained fusion, Chinese nuclear physicists, chemists, and laser experts have successfully completed a test using a double beam laser to hit a cavity target, thereby attaining a sufficiently high radiation temperature inside the cavity. The temperature achieved was higher than that attained in experiments conducted abroad using the same kind of equipment. According to the researchers, the attainment of the sufficiently high temperature inside the cavity has laid a solid foundation for realizing the next target of producing neutrons through radiation drive.

Inertia constrained fusion is also called laser-triggered nuclear fusion. According to the researchers, the success of the experiment means a gratifying step forward in the research on nuclear fusion, which can produce a new form of inexhaustible energy for mankind.

The comprehensive laser equipment was made by Chinese scientists and technicians in Shanghai 2 years ago, and all the components and materials were domestically made. Numerous experiments carried out with this equipment over the past 2 years have shown that its technical performance has reached the advanced level of the same kind of equipment abroad.

Coast To Receive More Nuclear Power Plants

OW3011022789 Beijing XINHUA in English 1450 GMT 29 Nov 89

[Text] Chengdu, 29 Nov (XINHUA)—Construction of nuclear power facilities will be gradually spread throughout East China's coastal areas in the 1990s, an official from the China Nuclear Industry Corporation said here today.

By the year 2000, the coastal areas will have a total generating capacity of six million kw of nuclear power and facilities with a total capacity of another six million kw will be under construction.

China started research and planning of nuclear power facilities in the 1970s. In 1985 China started construction of its first nuclear power station, the Qinshan Nuclear Power Station, which has a generating capacity of 300,000 kw.

In 1987 construction started on the Daya Bay Nuclear Power Station in Guangdong Province. This power station will have a capacity of 1.8 million kw.

By the end of next year, the Qinshan Nuclear Power Station is expected to go into operation; the second phase of this project has already been approved by the State Council.

Liaoning, Guangdong, Shanghai and other coastal provinces where coal and electricity are in short supply are preparing for construction of nuclear power stations.

Meanwhile, China will co-operate with other developing countries in building nuclear power stations.

Nuclear Industry Experiences 'New Dawn'

HK0512015689 Beijing CHINA DAILY in English 5 Dec 89 p 1

[By staff reporter Li Hong: "Nuclear Industry Experiences a New Dawn"]

[Text] China's nuclear industry, after three years' continuous decline in its realized profits, is seeing a new dawn this year, CHINA DAILY was told yesterday.

Senior industry officials are calling for continuing strenous efforts to bring about breakthroughs in the fields of nuclear power construction, civilian product exploitation and foreign trade next year.

It is predicted that China's more than 200 nuclear enterprises, both civilian and military, will see an increase of more than 30 percent in profits this year over last.

"This is not an easy gain. The gradual climb of our profits has been attained amid nationwide cutbacks in capital construction, strained supply of energy, raw materials and communication as well as rising prices," Jiang Xinxiong, president of China National Nuclear Industry (CNNI), told the annual meeting on nuclear industry being held in Chengdu, capital of Sichuan Province.

Jiang attributed the progress to the marked growth in the sales of civilian products, which are expected to bring a profit of 82.6 million yuan, up 25 percent over last year. Besides, the industry's deficit in defence production has decreased, while nuclear fuel enterprises, which used to lose money, have also become profitable, thanks to technological renovation, growing domestic sales and foreign trade.

At the meeting, Jiang put forward the plan for 1990 to develop the country's nuclear industry. Special attention will have to be paid to nuclear science and technology and management, he said.

The first phase of Qinshan Nuclear Power Station in Zhejiang Province will have to enter its overall debugging period by the end of March, 1990, and generate electricity by the end of 1990.

According to Jiang, this year workers have finished the biggest work-load of the project among the past several years. By the end of October, an accumulated investment of 950 million yuan had been gathered, 80 percent of the total earmarked for the first phase. And the money for the second phase of Qinshan Station is ready and its overall design is expected to be completed by the end of this year.

Meanwhile, the Daya Bay Nuclear Power Station in Guangdong Province is progressing according to schedule.

China has an ambitious programme to promote the development of nuclear power. Other nuclear power stations have been planned in Shanghai, Liaoning, Jiangsu and other eastern coastal provinces.

According to Jiang, some Third World countries like Pakistan want to introduce China's 300,000 kw nuclear power station into their country.

Also, the industry's exploitation and production of civilian products will have to reach a new high next year, Jiang said. A series of products with tangible economic results will be put into mass production.

This year the total production value of civilian products is predicted to hit 600 million yuan, accounting for 40 percent of the nuclear industry's total output value. According to CNNI's estimate, by the end of this year 98 out of the total of 114 civilian projects planned in 1985 will have been completed. Most of them are based on technology transferred from military products.

JAPAN

Plutonium Shipment From Europe Slated for 1992

Atomic Commission Decision

OW1212033689 Tokyo KYODO in English 0254 GMT 12 Dec 89

[Text] Tokyo, 12 Dec (KYODO)—The Atomic Energy Commission on Tuesday decided on a plan to transport plutonium from Europe to Japan under the escort of Japanese patrol vessels. The first shipment is scheduled to arrive in the fall of 1992, the commission said.

The plan to ship the plutonium—a key component in nuclear weapons—has stirred domestic debate because it will be the first time for Japan to send an armed vessel on overseas duty. Previous shipments were escorted by American and French naval ships.

Science and Technology Agency officials said the plutonium would be transported by sea because of delays in an original plan to use air transport after the United States demanded the program meet rigorous safety standards, now being developed.

Japan is bound by the U.S. position under a bilateral agreement because the plutonium was recovered from spent nuclear fuel originally processed in the United States.

"Our basic plan continues to be to develop a container for air transport," said Akio Yuki, director of the Nuclear Fuel Division at the Science and Technology Agency. Yuki said air transport is preferable to ocean transport because it is easier to protect from terrorist attacks.

So far Japan has spent around 1 billion yen on developing a casket that would contain plutonium even in the event of an airplane crash. Inhalation of even minute amounts of plutonium can be deadly.

Yuki estimated it would take 40 to 60 days to deliver plutonium to Japan from reprocessing facilities in France and Britain. He said the shipment would likely be between one to two tons. The plutonium is being recovered from spent nuclear fuel in reprocessing plants in France and Britain, and is scheduled for use in a fast breeder reactor called Monju scheduled to start operation in spring 1992.

Nuclear industry authorities say they will have enough plutonium to supply the 1,400 kilograms needed to start up Monju, but that they expect a shortfall starting in fall 1992. In addition to Monju, which is expected to consume 500 kilograms of fuel each year, two other reactors each require 100 kilograms per year.

Tokai Nuclear Fuel Reprocessing Plant has an annual capacity of 450 kilograms. The nuclear industry favors the fast breeder reactor because it can produce more renewed fuel than spent fuel.

Controversy in LDP Ranks

OW1212182289 Tokyo KYODO in English 1313 GMT 12 Dec 89

[Text] Tokyo, 12 Dec (KYODO)—The Atomic Energy Commission on Tuesday, amid objections from the ruling party, approved a plan to transport plutonium from Europe to Japan under the escort of a Maritime Safety Agency (MSA) ship.

A group of legislators in the Liberal Democratic Party's defense caucus voiced their strong oppositions to the plan, calling on the government to assign maritime Self-Defense Forces escorts to guard the shipment of plutonium by sea.

At a joint meeting of LDP [Liberal Democratic Party] committees concerned with defense matters, hardline members contended that an MSA vessel could not defend the plutonium transport ship against terrorist attack because of inadequate equipment.

Kimio Fujita, chief of the Cabinet Councillors' Office on External Affairs, told the meeting that the U.S. Government had given its approval for the plan. Under a bilateral agreement Japan is bound by U.S. positions because the plutonium was recovered from spent nuclear fuel originally processed in the U.S.

The meeting participants, however, demanded further government explanation of the plan and are scheduled to meet again Friday to discuss the matter.

The government decided in October 1988 to use an MSA ship as an escort for the transportation of plutonium from France and Britain, saying that sending a Japanese destroyer could be interpreted to mean that Japan was dispatching Japanese servicemen overseas in violation of the nation's Self-Defense Forces charter.

Under the plan, the first shipment is scheduled to arrive in Japan in the fall of 1992, according to the commission, headed by Eizaburo Saito, director general of the Science and Technology Agency. Previous shipments were escorted by American and French naval ships.

Science and Technology Agency officials said the plutonium would be transported by sea because of delays in an original plan to use air transport after the United States demanded the program meet rigorous safety standards, now being developed.

ARGENTINA

Nuclear Power Plant Use Assessed

90WP0012A Buenos Aires AMBITO FINANCIERO in Spanish 3 Oct 89 pp 54-55

[Text] Dr Manuel Mondino, the chairman of the National Atomic Energy Commission (CNEA), discussed the situation of the country's nuclear power plants in an interview. He mentioned that the personnel at the Embalse power plant were able to have it operating in a little under 4 weeks, which alleviated the power shortages that the country had been suffering.

Nuclear power accounts for just 8.4 percent of the country's total energy use. Thus, the importance that it has gained in recent months in the wake of the crisis that we have gone through is necessarily due to the shortcomings in the remaining 91.6 percent.

As for the Atucha plant, it is undergoing a complete overhaul as the result of an unprecedented incident after 13 years of flawless operations. The hope is that it will be on line again by late October.

Shutdowns were needed at Embalse for maintenance purposes, but owing to the crisis the date kept being postponed indefinitely as of October 1988. A deadline thus had to be set, and 30 July was finally decided on. The maintenance took 4 and ½ weeks, and the power plant is now once again supplying the grid.

We are having no power interruptions today because Embalse went on line. Its prompt return to service was due to the great maturity and competence shown by the personnel who maintain the power plants, thus assuring the intrinsic safety of the equipment.

As for financing Atucha II over a tentative period of 4 years so that construction can continue, we first of all are receiving a DM2 million loan under the "pari passu" system; it remains only for the president of the nation to endorse it. Moreover, talks are under way with Argentine firms in an effort to have them join the CNEA so that they can take care of financing the remainder of the project.

A Spanish consortium has also offered between $250 and $300 million that would be earmarked exclusively for Atucha II.

As for exports, Argentina has of late had the unquestionably very satisfying experience of installing a nuclear power plant in Peru. This marked the beginning of an ambitious program that will comprise other nations as well.

In this regard, we cannot forget the heavy-water plant project that began in 1980. Today the commission is having financial difficulties, which are preventing completion of the project. This is regrettable, given that the plant's output would be guaranteed to meet the needs of local nuclear power plants and to generate exportable surpluses.

Relations with Brazil, above and beyond the integration of the governments, have been based on professional integration, as many joint research and development projects are already under way, such as the long-term construction of breeder reactors.

An agreement has also been reached with the chairman of Brazil's Atomic Energy Commission, whereby the two countries pledge to take common stands, which they will have discussed in advance, in international forums. This is of great importance because neither country has signed the Tlatelolco Treaty or the TNP [Nuclear Nonproliferation Treaty] and hence this system of reciprocal safeguards is expected to be a very good policy.

Growth

This is the only clean energy source that the world is going to have in the future, unless another is discovered in the years to come.

The hope is that from now until the end of the century it will expand at a rate of 8 percent a year. Annual growth of 15 to 17 percent is expected for the early decades of the 21st century.

An assessment of our energy-production system leads to the conclusion that if we want to preserve the environment and grow like a modern country, our only choice is to develop nuclear power.

As for the policies that the CNEA plans to pursue to achieve the major goals that have been proposed, Dr Mondino wants to open up the commission to private capital so that the investments that the Argentine Government has already made can benefit as many people as possible and to make other investments feasible in the medium term.

In analyzing this issue, the CNEA chairman clarified beforehand that Argentina's nuclear program involves more than just generating atomic power; nuclear energy has a wide range of applications that can benefit the public in the areas of health care, foodstuffs, and production activities in general.

Opening up the commission could thus become very important in such ways as freeing up our 5 million curies of cobalt stocks for local use or for overseas sale. Today, paradoxically, cobalt for radiotherapy is in short supply.

There is also the issue of services for conventional power plants, since as a result of nuclear-technology standards techniques have had to be developed for maintaining equipment, and channels are needed here too so that private capital can help to convey all of this know-how to the country at large.

Based on Mondino's remarks, then, the private sector will hopefully complement government action.

The commission has already shown signs of interest in such integration; in fact, since 1976 it has encouraged the formation of partnerships, under various legal arrangements, in which it is involved to varying degrees and in different ways. Its aims in this regard have been to promote the regionalization of nuclear activity by enabling provincial governments to take part, and to make room for domestic or foreign private enterprise.

These companies have fostered greater freedom to do business and provided the benefits of private management experience in certain areas.

They are also becoming mainstays of Argentina's nuclear export efforts.

Companies

One of the companies is Altec, which was created by the government of Rio Negro and in whose management the CNEA is involved. Another is Conuar, which is in partnership with the Pecom company to provide the fuel elements to the power plants. A third is Coratec, which is the property of the Cordoba government, though the commission plays a role in running it. Enace was formed under an agreement with Kraftwerk Union of Germany to furnish engineering services and manage several projects having to do with the nuclear power plants. Fae was set up to manufacture parts needed for the production process that is handled by Convar, which has a controlling interest in its capital. Invap was also set up by the Rio Negro government to advance nuclear-power development, and finally, Nuclear Mendoza was established by that province under an agreement with the CNEA to meet specific requirements.

To repeat, an assessment of our energy-production system leads to the conclusion that if we want to preserve the environment and grow like a modern country, our only choice is to develop nuclear power.

Air Force Chief Discusses Condor Missile

PY2911235889 Buenos Aires NOTICIAS ARGENTINAS in Spanish 1705 GMT 27 Nov 89

[Excerpts] Buenos Aires, 27 Nov—Brigadier Jose Julia, the chief of staff of the Air Force, today asserted that "politically speaking, it would make no sense to carry out further tests of the "Condor II" because this test "would be misinterpreted" by other countries—which he did not identify—that are "interested in destabilizing our relationship with the United States." [passage omitted.]

When asked about the degree of development of the "Condor II", he ironically said that "it is as secret as it can be, considering that it is being exhibited here. A lot of fuss was made about the "Condor II" and the subject was handled in a purely political way" at an international level.

"It is nothing more than a vehicle capable of launching a satellite into space. Whoever says that it can be used for other purposes if aimed lower, is right, but our objective is peaceful."

Julia said that "technically speaking the project is almost complete," and asserted that "it cannot be postponed because it is a technological development to which Argentina has a right.

He added that "one can talk about its (hypothetical) export to 'hot' zones of the world, but that is not up to the Air Force to decide, it will eventually be decided by the executive branch."

After asserting that the "Condor II" "is ready to be tested, he said that a political decision is necessary for that, adding that "we are so certain it works properly there is no need to test it because we have full confidence in our engineers."

"Moreover, a test of this nature is very costly. We have already tested the components and they work well."

Julia also said that it must also be taken into account that "it would make no sense to test it now because it could be misinterpreted by countries interested in destabilizing our relationship with the United States."

When asked whether the article published last week by the British daily "Financial Times"—which described the "Condor" as an example of the proliferation of missiles—was political, Julia answered that "I have received information from our military mission in the United States stating that the article, that also caused repercussions in the U.S. media, was a campaign designed to jeopardize the improvement of relations" between Buenos Aires and Washington.

Nuclear Power Plants Supplier on Outlook

90WP0012B Buenos Aires AMBITO FINANCIERO in Spanish 3 Oct 89 p 55

[Text] The president of Liquid Carbonic Argentina, Horacio Luis Crosta, commented on his company's share of the market for supplying equipment to nuclear power plants.

The Liquid Carbonic group's connection with power generation is through metallurgy. It has two firms in this sector: Gases Industriales, which is actively involved in nuclear energy, and the CBI, a subsidiary of the American company Chicago Bridge Iron.

Gases Industriales plays an active role in the nuclear power field. It has manufactured equipment for the Embalse power plant and the reactor and equipment for Guarangal, the plant that Peru bought from the National Atomic Energy Commission and that was unveiled in December 1988. At the moment it is working under contracts connected with Atucha II.

Mr Crosta also recalled that after Embalse and Atucha there was talk of four nuclear power plants, Embalse being the first. Under the initial program, in a few years we were supposed to be building the fourth unit in the second series. In fact, however, we are barely halfway through the first.

As for the prospects on the overseas market, the president of Liquid Carbonic clarified, first of all, that nuclear power is a highly sensitive issue politically; consequently, it is very difficult to make such exports a completely private matter. The government unavoidably becomes involved, one example being the deal with Peru under the accord between governments in 1976.

CBI Argentina designs high-tech equipment for storing large volumes of natural gas or liquid fuels.

Accordingly, it has been active in the petrochemicals sector, installing spherical tanks that can hold 10,000 tons of ethylene in Lujan de Cuyo, Petroquimica Mosconi, and Bahia Blanca.

In conclusion, Crosta said that he hoped the announced measures would be taken, and he recalled that if there is anything that the country can produce, it is energy or oil and gas derivatives. Thus, if the nation moves in this direction, it will be a sign that it is on the right track.

BRAZIL

Reportage on Supercomputer Acquisition

INPE To Be First

90ET0015E Sao Paulo O ESTADO DE SAO PAULO in Portuguese 19 Oct 89 p 9

[Article by Jose Paulo Kupfer and Leda Beck]

[Text] The National Institute of Space Research (INPE), linked to the Ministry of Science and Technology, will be the first Brazilian entity to operate a large-scale scientific supercomputer. The INPE scientists have been working on the project for more than 2 years and the bidding for the purchase of equipment was finally opened on 9 August. "Internationally, there are no restrictions of any kind on imports," explained Pedro Dias, the Institute's director of meteorology, "nor do we see the possibility of any restriction by the U.S. Government, since the equipment will be used for a specific purpose, with all the safeguards."

To date, the INPE has already been approached by seven groups in response to the announcement soliciting bids and the deadline for tender proposals is 30 October. The director of the INPE believes that 30 to 45 days after that date the winner will be named. The timetable calls for the installation of the equipment in the beginning of 1991 in the INPE Center for Weather Prediction and Climate Studies, in Cachoeira Paulista (Sao Paulo) and the predicted investment is about $30 million. The groups include Clay Research, the world's largest manufacturer of supercomputers; at least two Japanese companies (NEC and Fujitsu); the North American firm, Unisys; IBM; and two smaller groups who want to supply parts of the system.

"The project does not call for just a supercomputer," confirmed INPE's director of meteorology. "We also want a storage system for meteorological data, a telecommunications system, and training and maintenance programs. The winning bidder should supply and integrate all this, in addition to arranging for $22 million in foreign financing." The minimum performance of the machine is 235 megaflops—or roughly 235 million calculations per second. The solicitation also calls for applied software packages for mathematical statistics and graphics.

Specific Task

The U.S. Government has a policy of impeding the export of very powerful machines with possible military applications, supercomputers being a typical example. "But our machine will be dedicated to weather prediction and climatic simulations," explained Dias, who also heads the INPE Center for Weather Prediction and Climate Studies. Although the INPE functions in Sao Jose dos Campos, its Center for Climate Studies is in Cachoeira Paulista, also in Sao Paulo State. There the institution will begin construction next month on a special building to house the supercomputer. "It will not have terminals and it will not be possible to access it through the telecommunications system," assured the INPE director. That telecommunications system will be used by the INPE center in Brasilia and will access the system for the storage of weather data—and not the supercomputer itself. Just the construction of the building, which will provide space to house two supercomputers operating simultaneously, should cost $6 million.

Japanese Participation

90ET0015F Sao Paulo O ESTADO DE SAO PAULO in Portuguese 19 Oct 89 p 9

[Text] Tokyo—Installed in Brazil more than 20 years ago, the NEC Corp. has been limited up to now to the telecommunications sector. This appears to have more to do with the market reserve adopted by this country and with conflicts with local associates than with any kind of strategic decision by the company. The aggressive way in which the company set forth its tender proposal for the INPE supercomputer is certainly an indication that the Japanese NEC could have more ambitious plans for the Brazilian market.

The NEC's participation in the bidding for the installation of the first supercomputer in Brazil is not in itself indicative of such intentions. After all, the product is to be imported in its entirety and, moreover, it will operate in an area far outside the boundaries of the reserve market for computers. Not even the potential demand for these powerful machines in this country, at least in the coming years, could inspire plans for local production. Even so, no one among the executives of Japan's NEC denies that winning the INPE competition would serve as an important spearhead for future market penetration by the company in sectors of advanced technology, such as communications satellites.

"If we could, we would like to operate in the area of computers and, to this end, we have considered the possibility of transferring technology to a Brazilian company," revealed Tadashi Suzuki, executive vice president of the NEC Corp., between sips of tea, in one of the meeting rooms of the company headquarters in Mita District, in Tokyo. Suzuki, whose highly successful career includes a 7-year stay in Brazil in the 1970's and, more recently, the presidency of the strategic NEC Corp. in America, guarded further information regarding this matter behind a polite smile, but he added that there had already been conversations with a Brazilian partner—businessman Roberto Marinho, president of the Organizacoes Globo and an associate of MEC in Brazil—regarding the formation of a company legally equipped to operate in the computer sector.

With more than 70 factory units installed in about 30 countries, producing more than 15 million items, from supercomputers and satellites to video cassettes and video games, the NEC is looking to the future, convinced that the communications sector will not survive unless it is integrated with the computer sector and certain of the increasing inevitability that production will be transferred to centers where the markets are seen to be attractive. "The NEC is prepared to bring in the technology and capital to bring about this local production, including in Brazil, which is an important market for us," Suzuki anticipated.

International Alliance

90ET0015G Sao Paulo O ESTADO DE SAO PAULO in Portuguese 19 Oct 89 p 9

[Article by Silvana Quaglio]

[Text] Brasilia—An international alliance in the area of computers, involving developing countries with similar industrial characteristics, could be created to confront the union among the advanced nations which, by means of agreements and alliances, seek to protect their technology and their position in the world market in the sector. This was the theory set forth yesterday by Ambassador Sebastiao Rego Barros in a lecture delivered to the Conference on National Computer Policy, organized by Senator Severo Gomes, (PMDB [Brazilian Democratic Movement Party]-Sao Paulo), in the Federal Senate.

"We have strategic and practical reasons to look in this direction," declared the ambassador, who has been following the development of the national computer industry. The alliance should bring together Brazil, Argentina, China, India, and probably the Eastern European countries. According to Rego Barros, it would be a difficult task, but politically possible, to bring about the union.

Based on the example of the developed countries, the ambassador also argued for government participation in the development and consolidation of the computer industry. In his view, the important thing is to assess the available instruments that could be used to ensure the strengthening of the computer industries, in developed countries and otherwise.

In the ambassador's assessment, Brazil's Computer Law is not xenophobic or overprotective; on the contrary, the National Computer Policy, Barros said, has few instruments for providing incentives to the industry. He noted, for example, that in the United States the Reagan administration invested $26 billion in 5 years in the development of the state-of-the-art technology called for in the Strategic Defense Initiative. Barros also cited the case of Korea, whose government ordered 5,000 microcomputers from the country's computer industry, even before it was established. In this way, the Korean Government managed to outfit its schools and, at the same time, to bring about the growth of the industry.

The United States is working within the GATT (the UN organ that regulates international trade) with the intent to establish standards for services, too, and not just for consumer products and capital goods, standards which could result in a new code of ethics for international trade. According to Rego Barros, the tendency is to establish stricter rules for exportation, and this could bring into question the legality of the Befiex plan, which calls for the concession of incentives for production destined for the foreign market.

Definition of Supercomputer

90ET0015H Sao Paulo O ESTADO DE SAO PAULO in Portuguese 19 Oct 89 p 9

[Text] They made it possible to design the NASA [National Aeronautics and Space Administration] space bus, the computerized topography equipment, and the MX missile, which saved the U.S. Navy $25 million because it could test the missiles with computerized simulation. Supercomputers, which a little more than a decade ago moved out of science fiction into governmental or university research institutions of the great powers, have now penetrated the giant companies of the developed countries and are becoming part of the daily life of the citizens.

What particularly defines them is the extraordinary speed with which they process data and a fabulous memory capacity, all based on the technology of parallel processing; that is, instead of a single central processor, as in the case of microcomputers, the supercomputer has a set of processors. Developing commercial software for this technology is an extremely complex matter, but there is increasing interest in this equipment, at least in the North American market. Hence the emergence of the vector processors, for example, for IBM's top-of-the-line model. This is the 3090, which is speeded up by the vector processor. According to the experts, this does not make it a supercomputer.

Like IBM, many other North American manufacturers are proposing to put "minisupers" on the market, based on parallel processing, but with substantially less speed

and memory capacity and at a much lower price, which would put them within reach of smaller users. The minisuper, then, is smaller than the supercomputer but larger than the traditional mainframes (the 3090, for example, is a mainframe when it is not equipped with the vector processor).

Recent studies indicate that the world market for supercomputers will jump from under $1 billion per year, where it stands today, to about $6 billion in 1993. Two important changes have occurred in this market in the last 18 months: the entry of the Japanese in the business and the increased processing power of the minisupers. After Cray, the second and third largest manufacturers are, in order, Fujitsu and Hitachi.

Nazare on Inability To Make Bomb for 10 Years

90ET0028Z Sao Paulo O ESTADO DE SAO PAULO in Portuguese 22 Oct 89 p 27

[Text] Brasilia—Last week nuclear physicist Rex Nazare Alves, chairman of the National Commission for Nuclear Energy (CNEN), gave assurance that Brazil and Germany would maintain the agreement signed in 1975, which will expire in 1990, with a new agreement valid for another 5 years. According to Nazare, there are no official or real reasons for interrupting it. He claims that the recent meetings between the two countries (during August in Brazil and September in Vienna) were sufficient to achieve the maintenance of the agreement for the construction of Angra II and III.

The CNEN chairman refuted the charge made by the German magazine, DER SPIEGEL, that Brazil's autonomous program was being directed toward military goals and that the terms on safeguards signed by the two countries with the International Atomic Energy Agency (IAEA) were not being fulfilled. Nazare claims that Brazil has always met its obligations in the tripartite safeguards agreement. He maintains: "The international agency has never mentioned failure to fulfill our responsibilities in its reports and analyses." He claimed that everything has been checked by the board of governors comprised of the countries using nuclear energy.

In an exclusive interview with ESTADO, Rex Nazare said that charges such as that made by the German magazine are common, and are aimed at hampering the development of this type of energy in Third World countries such as Brazil. In his view, under normal operating conditions nuclear energy is the type causing the least impact on the environment, added to the fact that it does not contribute to the greenhouse effect. The physicist notes that, for this reason, there is a worldwide movement to limit its use exclusively to industrialized countries.

Statistics

In Nazare's estimation, "They are trying to conceal the fact that 57 percent of the greenhouse effect occurrences originate from electric power generation, and that there are 434 nuclear units operating in the world generating that power, and another 100 under construction, creating an incalculable market for equipment and fuels." According to data submitted by the IAEA (headquartered in Vienna) last month, the United States is constructing another 5 nuclear units, when it already has 110 power plants. In the other countries, the situation is as follows: 14 plants under construction and 38 operating; 9 in France, besides the 55 existing ones; 18 in Canada, which is already operating 4; 6 in Germany, plus the 5 current ones; and 26 in the Soviet Union, which currently has 56 plants in operation.

As for the construction of a bomb within 2 years, based on the opinion of U.S. scientists William Higginbotham and David Albright (in a claim made to FOLHA DE SAO PAULO), the CNEN chairman says that Brazil lacks the necessary money and technology. He comments: "Our programs are directed toward and concentrated on the peaceful use of nuclear energy." According to Nazare, the recent past use of this technology in the United States to manufacture bombs enabled the two scientists to make erroneous interpretations. He maintains that the Brazilian Constitution bans the manufacture of nuclear weapons, in addition to the fact that the country is not vying for supremacy with anyone, much less suffering the threat of a military invasion by a militarily nuclear nation.

He observes ironically: "If there were a decision on the part of the Brazilian people to make the bomb, we would require at least 10 years for laboratory work alone; 2 or 3 years would be a big kick, without direction."

INDIA

Analyst Argues Against Nonproliferation Meeting

51500036 Madras THE HINDU in English
25 Oct 89 p 8

[Article by K. Subrahmanyam.]

[Text] The 1990 conference on the Non-Proliferation Treaty is merely a deliberative conference with no powers to modify the treaty. India attending it as an observer will be counter-productive. What India has to strive for is a package of proposals at the Committee on Disarmament for a step by step progress towards a nuclear weapons free world.

In his article "Non-Proliferation Treaty revisited" (THE HINDU, 28 September 1989) Mr M.A. Vellodi has made out a case for India attending the next NPT Review Conference in 1990 as an observer. He acknowledges that the observer status imposes certain restrictions as an observer country cannot table proposals or participate in decision-making. However, in his view our presence at the conference, even as an observer, would give us an opportunity to exchange views with others and express our views through one or more statements, presumably through friendly, like-minded delegations. He also warns India against going there to wreck the conference but would like India to make a sincere effort to see reason and common sense prevail and to make a positive contribution to the furthering of the favourable trend which is visible on the horizon.

Mr Vellodi's credentials are impeccable. Both of us have worked together as colleagues in the Government on issues relating to the NPT and had shared perceptions. Mr Vellodi along with Mr Jaipal initiated, in 1978, the Indian resolution which subsequently became the Non-aligned resolution at the special session on Disarmament first and subsequently in the General Assembly that use and threat of use of nuclear weapons ought to be banned pending the final elimination of nuclear weapons.

This resolution had been moved in the General Assembly in successive years and in the last count had received 138 votes including those of the Soviet Union and China. The same point features in the Delhi declaration issued by the Prime Minister, Mr Rajiv Gandhi, and the Soviet President, Mr Mikhail Gorbachev, on 26 November 1986.

Puzzling Suggestion

Given this background of Mr Vellodi's contribution to India's struggle to promote the cause of genuine non-proliferation, one is somewhat puzzled by his advocacy of India's attending the next NPT review conference as an observer—all the more so because his objective of promoting progress towards a nuclear-weapon-free world is not at all in doubt. The issue is whether that objective will be better served by India attending the review conference as an observer.

In this writer's view not only India's attendance at the review conference will not promote the cause of the true non-proliferation it will be counter-productive. First, as admitted by Mr Vellodi, India as an observer will not have the same rights as other nations and having protested against the NPT as an unequal and discriminatory treaty will it behove India's dignity to be a second class participant in that review conference? Our attendance in that conference will be deliberately twisted to proclaim to the world that India is finally coming round towards acceptance of the NPT in its present form. When such propaganda is made in the forum of the conference we will have no right to reply as an observer. Even if we distribute documents outside the conference (the procedures may prevent our statements being circulated as conference documents) word would go round that India's presence as an observer will be highlighted as speaking louder than documents circulated outside the conference hall.

Our presence as an observer, it will be argued by the protagonists of the Treaty in its present form, will show that the Treaty was alright in its essentials and if persisted India will in due course move from observer status and accede to the Treaty in its present form. It will certainly look odd that while there are no indications that China and France which have been given a privileged status in the Treaty would attend the review conference, India which has been discriminated against should accept the observer status.

India has been arguing in the councils of the world that China and France should be brought within the disarmament process. If India were to attend as an observer without China and France agreeing to come into the disarmament process how would that be interpreted in China, in particular, and the world in general?

When the Chinese Foreign Minister was asked whether during the visit of the Prime Minister to Beijing in December 1988 a common strategy on nuclear disarmament would be discussed, he replied that since India was a non-nuclear weapons country there was no point in discussing nuclear issues with India. Will not our presence in the NPT Review Conference in the second grade status confirm to the world that on nuclear issues, India need not be considered a serious actor?

The Central Feature

Before attempting to formulate a strategy for India in respect of the next NPT Review Conference it is essential to have an analysis of the current situation in respect of the NPT. The most telling argument the nuclear weapon cultists have been using in support of the iniquitous treaty is that nuclear weapons cannot be disinvented and, therefore, the distinction between the haves and have-nots is the central feature of the Treaty. Now the U.S. President, Mr George Bush, has formally proposed total elimination of chemical weapons in a phased manner and the Soviet Union has responded to it positively.

The crucial point here is the Americans, the British and the French who are all keen on total elimination of chemical weapons seemed to have overlooked the argument that chemical weapons also like nuclear weapons cannot be disinvented. If in spite of that the major industrialised nations are prepared to go in for total elimination of chemical weapons it is a relevant question why the same logic cannot be extended to nuclear weapons.

The crucial factor underlying this differentiated approach is that chemical weapons can be made today by many developing nations. Hence, this urgent call by the U.S., British and France to eliminate the weapons. On the other hand in the case of nuclear weapons these countries are under the impression that they can continue to maintain their cartelised possession and hence the argument that nuclear weapons cannot be disinvented and their reluctance to agree to eliminate them.

In the Paris conference held in January many Arab countries took the stand that so long as Israel possesses nuclear weapons they would like to keep the option open to have chemical weapons. Though this is not India's stand we should be mindful of the possibility that in the next review conference the undeclared Israeli nuclear weapons will feature prominently. Similarly, Pakistan too has an undeclared nuclear arsenal. Mr Bush's latest certification that Pakistan does not have a nuclear bomb may only be terminologically accurate.

The U.S. could have argued that on 5 August 1945 it did not have a nuclear bomb since only that night physicist Luis Alvarez armed the bomb before it was loaded on to the aircraft Enola Gay to be dropped on Hiroshima the next morning and it was an untested one.

A prerequisite for progress towards elimination of nuclear weapons and for achieving genuine nuclear non-proliferation is a fool-proof verification system. Today, it is generally accepted that no arms control or disarmament agreement will be acceptable unless there are water-tight verification systems. The NPT's fatal flaw is that it does not have a verification system.

Even now as the START talks progress, verification procedures may be worked out for elimination of particular numbers of strategic weapon categories. This is at present essentially a matter between the two foremost nuclear weapon powers who have declared arsenals. How to extend this to other nuclear weapon powers and to undeclared nuclear weapon powers has to be worked out in the light of the experience of the START verification procedure. At present it does not look as though the International Atomic Energy Agency (IAEA) is likely to have a role in this process. Mr Rajiv Gandhi's proposals for ensuring that the fissile materials from warheads are kept safe from being recycled into new weapons and his three-stage disarmament proposals have not received any serious attention from nuclear weapon powers other than the Soviet Union. In fact there are complaints that India itself has not followed up the proposals seriously.

Verification means that both sides agree with adequate degree of confidence about each other's stockpiles and they should be in a position to ensure their destruction and that thereafter they are not reassembled. This was possible in respect of easily verifiable items like the U.S. Pershing-IIs and ground launched cruise missiles and the Soviet SS-20s. So it is possible in respect of strategic missiles except the Tomahawk sea-launched cruise missiles about which there are still controversies in the START talks. In regard to aircraft-borne nuclear bombs of the type believed to be in possession of not only the five declared weapon powers but also the undeclared weapon powers like Israel and Pakistan, there are considerable verification problems which are yet to be conceptualised let alone developing methodologies for them.

The NPT Review Conference is not a negotiating body but a deliberative one. Next year by the time the NPT Review Conference is convened most probably the U.S. and the Soviet Union would have reached some agreement on START. Even after START is concluded and implemented, as France and China point out, the U.S. and the USSR will only bring down their share in the world nuclear arsenals from 95 to 90 per cent, which is no big deal. Yet the sponsors of the NPT would claim that they have substantially fulfilled their obligations under Article VI of the NPT. India's presence at that stage in the conference accepting the lowly observer status will further reinforce their stand that everything is alright with the NPT.

Vital Difference

There is a vital difference between strategic negotiations and participating in a deliberative conference. The NPT Review Conference is merely a deliberative conference with no competence to negotiate any modification to the NPT. The nuclear weapon powers, which sponsored the NPT, have given no indication that they are willing to consider any modification to the Treaty as it stands at present. Their stand is that they would negotiate arms control measures among themselves according to their mutual convenience but the rest of the world should continue to accept the subordinate status and discriminatory treatment. They have not learnt any lessons from the flaws of the NPT but are attempting to bring in another version of the NPT in respect of missile technology proliferation which will again discriminate against the have-nots and perpetuate the dominance of the haves.

There are no doubt positive signs in respect of nuclear arms reduction arising out of the contradiction in the nuclear strategies of major powers which have piled up vast quantities of unusable weapons. One should welcome those positive signs but this should not be confused with any likelihood of reforming the iniquitous NPT. The NPT is a fatally flawed document. It does not condemn the use and threat of use of nuclear weapons and make the weapons illegitimate. No legitimate weapon can ever be eliminated or limited to the cartelised possession of a few countries only. It has no

verification provision which is today considered the heart of any arms limitation or elimination agreement. It could not anticipate the emergence of undeclared weapon states and the treaty is totally inadequate to deal with this phenomenon. In fact, undeclared weapons cannot be dealt with unless the world reverts back to the Baruch idea of total international control of all nuclear activities and elimination of all nuclear weapons.

Outdated

No one can dispute the suggestion that India should have a positive approach to the concept of a nuclear weapon free world. The idea of non-proliferation, as propounded by India in 1965 in Resolution 2028, is now out of date. At that stage the concept required the weapon- producing nations to stop weapon production and other non-weapon nations not to start on that road. Such a concept was sensible in a world where there was a clear cut demarcation between a weapon state and a non-weapon state and there was no category of undeclared nuclear-weapon- capable nations. Today's world is too complex to be handled within the framework of Resolution 2028 of 1965.

Further India is about to enter an era when both its nuclear and missile capabilities are likely to receive due respect and attention from the international community. Before 1995 when the NPT is due for reconfirmation and extension India would probably have tested missiles of range and accuracy not inferior to those of other powers. It is recognised that India, with its expanding civil nuclear power programme, would have accumulated more plutonium than China by the year 2000. Our fast breeder programme and uranium 233 reactor would have advanced further.

If in spite of all these developments the sponsors of the NPT were to reconfirm the NPT in 1995 they will be confirming not only the status of the 140-odd nations which have subjugated themselves to the iniquitous treaty, they will in reality be confirming the status of undeclared nuclear weapon powers as well. Given the increasing awareness all over the world of the unwinnability of a nuclear war, one need not get too scared of a world of five declared nuclear weapon powers and another five or six undeclared nuclear weapon powers.

It is not the contention here that India should not take the initiative to replace the present NPT by a treaty which will declare nuclear weapons unlawful, which will aim at elimination of the weapons all over the world, bring about a non-discriminatory verification regime and stop all further research on nuclear weapons all over the globe. But the route to that objective is not through accepting the second grade observer status at the NPT Review Conference but mobilising support in the Conference of the Committee on Disarmament (CCD) for a package of proposals incorporating not only the above objectives but also a methodology for verification and step-by-step progress towards a nuclear-weapon-free world. India will have the necessary clout to take such initiatives in the next few years. Meanwhile, let the Government start working seriously on verification methodologies.

U.S. Stand on Nuclear Proliferation Scored

51500034 Bombay THE TIMES OF INDIA in English 24 Oct 89 p 14

[Article by K. Subrahmanyam.]

[Text] Among the 16 developing countries listed as possessors of ballistic missiles by the U.S. Arms Control and Disarmament Agency (ACDA), Pakistan, Iran, Saudi Arabia and South Yemen are in close vicinity of India. There are, besides, the three major missile powers, China, the USSR and the United States (with its central command covering large areas of the Indian Ocean littoral). The latter three also are the missile suppliers to the developing countries.

It is clear from this that if any one country in the world is compelled to develop missiles because of the proliferation and deployment policies adopted by major missile powers, it is India. It is ironic that having created a major security problem through spreading missiles around this country, India is being indicted by the U.S. for a programme of missile development in response to these threats.

The ACDA analysis appearing in its annual publication "World Military Expenditures And Arms Transfers, 1988", highlights the concern over the spread of ballistic missiles in the developing world. While possession of ballistic missiles by the U.S., its NATO allies, Japan, China and the Soviet Union is treated as their legitimate prerogative, the following 16 countries are listed as ones whose endeavours to acquire a missile arsenal aggravate instability: Egypt, Iran, Iraq, Israel, Libya, Saudi Arabia, Syria, North Yemen, South Yemen, India, North Korea, South Korea, Pakistan, Taiwan, Argentina and Brazil.

Chinese Technology

The missiles deployed or under development range from 25 miles range Oghab (Eagle), developed jointly by Iran and North Korea, to the CSS-2 supplied by China to Saudi Arabia with a range of 1,860 miles. ACDA notes that USSR supplied Frog-7 and Scud (B) missiles to Egypt, Iran, Iraq, Libya, Syria, South Yemen and North Korea and SS-21 missiles to Syria and North and South Yemens. But the U.S. is not blameless either. It provided Lance missiles to Israel and Honest John to South Korea. The Iranian missile Iran-130 is of Chinese origin. Pakistani Hatf-I and Hatf-II missiles are reported by ACDA to have been developed with the help of Chinese and Western European technology. A 500-km range Libyan missile and the 800-960 km Argentinian Condor-II of 500-600 miles range are being developed with West European technology. As distinct from those relying on supplies from industrialised countries and China, countries depending on their own indigenous R and D are Israel, Argentina, Brazil, South Korea and India.

The ACDA report talks of developing countries offering high salaries to scientific mercenaries to leave sensitive jobs in the U.S. and elsewhere to join their arms development programmes. Such self-righteous indignation hardly behooves those who recruited Werner Von Braun, formerly of the Peenemunde rocket establishment of Nazi Germany, and a host of ex-Nazis to produce missiles for the U.S. The U.S. atom and hydrogen bombs were also developed with a host of European scientists (both from Western and Eastern Europe), who made immense contributions.

Cartelist Mind-Set

What is overlooked by those with a cartelist mind-set both in the case of nuclear weapon proliferation and missile proliferation is the crucial fact that the greater the proliferation of nuclear weapons and missiles in the industrialised countries, the larger is the number of knowledgeable and trained scientific personnel in those countries. Some of them will always be available for hiring by oil-rich nations. Western scientific personnel are more likely to go to countries which are aligned to the West though the reported German-Libyan connection is an exception to this rule.

The London Suppliers' Club in respect of nuclear weapon-related components and equipment failed to halt the flow. So will the missile technology control regime established at U.S. instance. Just as the U.S. strategic policy objectives vis-a-vis Afghanistan overrode non- proliferation concerns in respect of Pakistan, the same is likely to happen in the case of missiles too. In spite of all its influence and presence in Saudi Arabia and Pakistan, the U.S. was either unable to get intelligence in time to forestall the Chinese deals with these countries or worse still perhaps knew about the transactions and chose to remain silent. In either case, neighbours of states receiving Chinese missiles and technology have cause to worry. Nor does it justify any assumption that China itself would not use such missiles.

All this leads to the inexorable conclusion that missiles in the hands of industrialised nations and China are highly destabilising and endanger international peace because they are passed on to other countries. A panel of eminent U.S. strategists which included such eminent pundits as Kissinger, Brazezinski, Ikle and Wohlstetter came out last year with a report on long-term integrated strategy called "discriminate deterrence." This document acknowledged that war between U.S. and USSR was negligible probability: the U.S. interests were seen by these strategists to be threatened by a likely turbulence in the developing world. They advocated use of long-range accurate missiles in interventionist operations against developing nations.

After arming themselves with accurate long-range missiles, the industrialised nations are attempting to disarm the unarmed, namely the developing nations and hence the sanctimonious proposals about the missile technology control regime.

The Arms Control and Disarmament Agency's report states with cynical self-righteousness "the very presence of these weapons in conflict-prone regions in the world aggravate instability. The potential for accidental launch, takeover of launch facilities by such national groups, or use of missiles to intimidate neighbours or pursue territorial ambitions is significantly higher in the Third World than it is among the traditional missile states. There are several reasons for this: disputes are more volatile and wars more common in these regions, the stability of Third World governments is often fragile, and the high value ascribed to a limited number of missiles is likely to heighten a 'use them or lose them' attitude. To make matters worse, missile proliferation is occurring at a time when many of the countries involved also are proceeding apace with nuclear or chemical weapons development programmes."

Military Supplies

Of the states listed as possessors of missiles in the developing world, Israel, Egypt, Pakistan, Saudi Arabia, South Korea and Taiwan have very close military relations with the U.S. and the first three are the recipients of very substantial military aid from the U.S. The U.S. has turned a blind eye to the nuclear weapon programmes of Israel and Pakistan. Other countries, especially in the Arab world, justify their missile and chemical weapons programme with reference to Israeli nuclear and missile capabilities. The U.S. and the USSR through their excessive military supplies make the region conflict-prone.

The same ACDA report has a section on the cost of Iran-Iraq war which highlights that 28 countries of the world supplied arms to both Iran and Iraq to the extent of $55 billion and kept the war going for 8 years. More than four-fifths of the supplies came from 14 countries and China including all the missiles used in the war. What credibility do these merchants of death have in asking developing nations to forswear missiles?

So long as the industrialised nations and China have missiles in their arsenals, they will be in a position to supply those missiles to their favoured nations as and when it suits their policies. Given the record of interventionism of industrialised nations, their selectivity in high technology weapon transfer, and the consequent spread of nuclear and non-nuclear missiles all around this country, India has no choice but to pursue with utmost vigour its integrated missile programme with its own indigenous R and D.

Prime Minister Discusses Defense, Nuclear Policy

BK1512111089 Hong Kong AFP in English 1040 GMT 15 Dec 89

[By Kate Webb]

[Excerpts] New Delhi, 15 Dec (AFP)—Prime Minister Vishwanath Pratap Singh indicated strongly Friday that he

would continue India's heavy defence spending despite the budget crunch facing his two-week-old government.

"Certainly we cannot compromise on security," Mr V.P. Singh said when asked at his first news conference since taking office if defence spending might be cut.

"Many times we have to respond to threats from across the border," he said in an apparent reference to Pakistan, with which India has fought three wars.

Defence experts here have said they expect the next defence budget to rise from the current nine billion to 12 billion dollars, with most of the hike already committed for a third aircraft carrier, new tanks, a fast light fighter plane and a satellite launch vehicle.

Mr V.P. Singh, who is also defence minister, stressed that his approach to neighbouring countries such as Sri Lanka, Nepal, Pakistan and Bangladesh would be one of "neighbourliness" and "not of arms and bullying tactics."

"I want to make this very clear," he said. "The strength (of our relationships) lies in mutual understanding." [passage omitted]

He also said that there were areas in which India could strengthen ties with Pakistan, but indicated that there would be little change from the previous Indian Government's attitude on nuclear weapons, which linked any agreement between India and Pakistan to global nuclear agreements.

"I think this (the India-Pakistan nuclear question) is not only bilateral but global," he replied when asked if his government would take any steps to negotiate a regional nuclear pact. [passage omitted]

Prime Minister Wants To Avoid Nuclear Race

BK0412032589 Delhi Domestic Service in English 0240 GMT 4 Dec 89

[Excerpt] The prime minister, Mr Vishwanath Pratap Singh, has called for a dialogue with Pakistan to ensure that a nuclear race does not start in the subcontinent. He said the initiative should come from Pakistan as there are reports that Islamabad is well advanced in the making of a bomb. Mr Singh, in an interview to the Dubayy-based English daily THE KHALEEJ TIMES, said we should certainly avoid the path of going nuclear, otherwise it is going to be a tremendous strain on our resources. He said India's nuclear program is meant only for peaceful purposes. [passage omitted]

Handling of Kalpakkam Heavy Water Leak Explained

51500031 Madras THE HINDU in English 21 Oct 89 p 3

[Text] Madras, 20 Oct—The two units (each of 235 MW capacity) of the Madras Atomic Power Station (MAPS), Kalpakkam, will start working at 75 per cent of their capacity in a few days after clearance is give by the safety review committee, according to Mr V. Rangarajan, Chief Superintendent, MAPS. Both the units are now operating at 50 per cent capacity viz., they are generating 90 to 95 MW from June.

He told presspersons at Kalpakkam on Wednesday that both the units would operate at 75 per cent of their capacity for the next six to eight months. Further modifications would be taken up in June, 1990, and the two reactors would start operating at their full-rated power three months later. "By these modifications, we will be approaching the original status," Mr Rangarajan said.

Explaining the genesis of the problem in the two reactors and how it had been tackled so far with indigenous technology, he aid a minor heavy water leak was detected in one of the calandria tubes in the second unit in August, 1988. It was successfully identified and plugged. Subsequent inspection revealed that the baffle plate of the heavy water inlet manifold inside the reactor vessel had got damaged. (The baffle plate distributes the flow of heavy water to the entire cross-section of calandria and also cools the total area.) A similar problem was also located in the first unit in March, 1989. The MAPS authorities immediately launched a big "trouble-shooting" operation and devised sophisticated video-cameras and lighting techniques because the problem had occurred in a highly radioactive area. They also developed remote- controlled manipulators. Thus, the metallic pieces, that had come off the inlet manifold, were picked up by remote manipulator and deposited inside a safe location in the reactor, where they would not hamper the operation of the reactor. As an immediate measure, the original outlet line from the reactor vessel was converted into an inlet line and with reduced flow of heavy water, the two units were started in late June this year.

"We have now proved that the reverse mode of operation is possible," the MAPS Chief Superintendent said. "The restoration of the units has clearly demonstrated a very high level of indigenous capability built up in designing, operating and trouble-shooting of nuclear power stations. We are able to get over the setbacks, because of the technology available."

Meanwhile, design and development work for the long-term rehabilitation of the units to restore full power operation were in an advanced stage of progress, he said. These modifications would be taken up in June, 1990, when hydel power generation would pick up following the monsoon. With this modification, there would not be any appreciable derating of the units. The new proposal envisaged admission of heavy water to the reactor vessel through 3 of the total 306 lattice positions.

After the units were restarted in June 1989, they had been consistently operating with high availability factors of more than 90 per cent.

Kalpakkam Facility to Produce Plutonium by 1992

51500032 Bombay THE TIMES OF INDIA in English 23 Oct 89 p 13

[Text] Kalpakkam, 22 Oct (UNI)—The country's second plutonium production facility would be ready by 1992

with the completion of the reprocessing plant here, to utilise the unspent natural uranium fuel from the Madras atomic power station (MAPS).

The reprocessing plant which could handle three tonnes of unspent fuel from atomic reactors every year, will produce about two tonnes of plutonium by the turn of the century. The recovered metal is to be used in the country's second generation power stations—fast breeder reactors, according to Dr C.V. Sundaram, director of the Indira Gandhi Atomic Research Centre, here.

Besides plutonium, the Kalpakkam reprocessing plant (KARP) would also produce uranium 233, from the fuel wastes.

A reprocessing plant is already functioning at the Tarapur atomic power station.

Sources at the Bhabha Atomic Research Centre (BARC), which would be running the reprocessing plant, said that the plant was likely to cost between Rs 150 crores and Rs 200 crores.

The plant would use the solvent extraction process with a scaled up model of the Tarapur reprocessing centre. Under the process, the unspent fuel from MAPS would be dissolved in nitric acid to enable recovery of both plutonium and uranium.

The IGCAR is also engaged in evolving a reprocessing programme for the recovery of plutonium from irradiated fuel from the fast breeder reactors. The task would be difficult because of the highly radioactive and chemically reactive nature of the fuel discharged by reactors.

The major steps in reprocessing included chopping of fuel pins into small pieces, dissolution of fuel, clarification of the solution and solvent extraction cycles for separating and purifying uranium and plutonium from fission products.

The country has also developed techniques to treat highly radioactive wastes emerging from the reprocessing plants.

According to Dr Sundaram, after storing for an interim period, the liquid wastes would be converted into solid glass and encased in metal cans. These cans would be stored at below ground level at the plant site itself before being deposited in an underground repository.

The BARC is carrying out extensive tests in the deep mines of the Kolar gold fields (KGF) to locate the country's first deep repository for nuclear wastes.

Dr Sundaram said the deep repository should be located in an area with geological stability. Besides KGF, there were other formations in the Aravalli ranges that offer an ideal location for such repositories. The location could be decided only after extensive tests which were in an advanced stage now.

The research centre is engaged in completing design report for the Rs 1,000-crore prototype fast breeder reactor (PFBR).

With a thermal power of 1,200 mw, the reactor would have 180 fuel sub- assembles with four primary sodium pumps and 80 intermediate heat exchangers.

Like the fast breeder test reactor, the PFBR would use liquid sodium as coolant with the height of the core of the reactor being 1 metre and diametre 1.9 metres.

The PFBR would have a 40 per cent thermal efficiency compared to 29 per cent of the pressurised heavy water reactors.

Report on Fast Breeder Reactor Expected Soon

51500035 Madras THE HINDU in English
24 Oct 89 p 7

[Text] Madras, 23 Oct—The Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam, will submit a detailed project report to the Union Government before the end of this year on establishing a 500 MW prototype fast breeder reactor (PFBR) at Kalpakkam.

Mr S.B. Bhoje, Station Superintendent, Fast Breeder Test Reactor, and Head of the Reactor Operation Division, IGCAR, told reporters, "We are at present preparing a detailed project report on the prototype fast breeder reactor for submitting to the Government for financial sanction. The cost of the project is Rs 1,000 crores." It would use mixed plutonium-uranium carbide fuel, and liquid sodium would be the coolant to produce electricity. It would be a full size, commercial power reactor.

The PFBR's containment building will be 38 metres in diameter and it will have a single containment as there was no need for a double containment for this reactor, he said. The reactor would be commissioned by 2000 A.D.

Starting up FBTR: The Fast Breeder Test Reactor (FBTR), which is under shutdown for biannual testing of containment for any possible leaks, will be started up in November. It was restarted in May, 1989, after a shutdown of two years because the non-fuel sub-assembly and the guide tube got bent. The IGCAR did a number of mock-ups and devised a special device for cutting the bent guide tube and removing it. The IGCAR scientists also successfully retrieved the damaged non-fuel subassembly and the reactor was started up in May this year. Since then, reactor physics experiments had been conducted, Mr Bhoje said. The FBTR's capacity is 40 MW thermal (13 MW electrical).

After the FBTR is restarted next month, the IGCAR scientists are expected to complete their high power physics tests and engineering tests by February, 1990. The reactor would operate at 10 MW thermal capacity up to March, 1991 and attain full capability in June, 1991. Later, it would be connected to the grid.

Kamini research reactor: The Kamini research reactor will be commissioned by December this year, according to Mr C.V. Sundaram, Director, IGCAR. (The IGCAR is setting up this reactor as the first step in harnessing the energy potential from the vast thorium reserves in the country and this will operate with thorium-derived fuel. This fuel is a fissionable isotope of uranium, called uranium 233 and is produced by the transmutation of natural thorium upon irradiation in a nuclear reactor).

Mr Sundaram said Kamini's fuel (uranium 233) had to undergo reactor physics tests in the Poornima reactor, for which clearance was awaited. Then the fuel would be brought to Kalpakkam and the reactor is expected to attain criticality in December.

The IGCAR Director, tracing the development of India's nuclear power development programme, said the first stage of India's three-stage programme for the generation of nuclear electricity was based on pressurised heavy water reactors (PHWR). They used natural uranium, available in India as fuel, and heavy water was the coolant and moderator. Natural uranium contained only 0.715 per cent of the fissile isotope U-235, the fission of which was the source of energy in PHWRs in Rajasthan, Kalpakkam and Narora (Uttar Pradesh).

Use of non-fissile isotope: In the second stage of India's programme, the non-fissile isotope U-238 will also be used for power production through fast breeder reactors operating on the uranium- plutonium cycle. Progressive operation of the PHWRs made available plutonium as a by-product by the transmutation of U_{92}^{238}. The breeder reactors could be so designed as to produce more plutonium from U-238 than the plutonium they consumed for power generation. Hence it is called fast breeder reactor—a fast reactor "breeds" fuel (plutonium) while generating power. Hence the establishment of the FBTR, the 500 MW PFBR, and ultimately a series of fast breeder reactors.

In the third stage of India's nuclear energy programme, the thorium reserves will be used to generate power. This will be based on fast breeder reactors working on the thorium-uranium cycle. The Kamini reactor will be a small beginning in this direction, Mr Sundaram said.

AEC Chief Tells Plans, Progress in Nuclear Technology

51500033 Madras THE HINDU in English
23 Oct 89 p 3

[Text] Madras, 22 Oct—The Government's approval is awaited for setting up six more nuclear reactors of 500 MW capacity each and the sites "are under consideration," Dr M.R. Srinivasan, Chairman, Atomic Energy Commission, said here on Saturday.

These six units would enable India to reach the target of generation of 10,000 MW of nuclear electricity by the turn of the century. (The Government has already approved the setting up of six units of 500 MW—four at the Rajasthan Atomic Power Station and two at the Tarapur Atomic Power Station).

Delivering the Sir M. Visweswarayya memorial lecture on the occasion of Engineers' Day organised by the Association of Mysore Engineers, Madras, Dr Srinivasan said the second unit of Narora (Uttar Pradesh) and both the units of the Kakrapara (Gujarat) atomic power stations were expected to attain criticality between 1990 and 1992. These units were of 235 MW capacity each.

Work had commenced on four more units of 235 MW each, two in Rajasthan and two at Kaiga in Karnataka. One more heavy water plant would be set up at Aonla in Madhya Pradesh. (The 235-MW and 500-MW units would use natural uranium as fuel and heavy water would be the coolant and moderator). Additional fuel fabrication plants were planned in Hyderabad, Turamdih and in Chidambaranar district in Tamil Nadu for uranium fuel and zircaloy products for reaching the 10,000 MW nuclear power capacity.

India was the only developing country which could design nuclear power plants, produce heavy water for them, fabricate nuclear fuel and also run a fast breeder test reactor. Commenting on the Comptroller and Auditor-General's report on the nuclear power establishment. Dr Srinivasan said the nuclear technology was a growing technology. But while measuring it, people tended to use the yardstick applied to mature technologies such as building a dam or establishing a steel and fertilizer plant. The technology in these fields had reached a plateau. But the nuclear power technology enabled its scientists to go into it deeper and its strength lay there.

The fact that nuclear electricity could contribute to preserving the environment might come as a surprise to many. The burning of fossil fuel such as oil, gas and coal had led to a 20 per cent additional concentration of carbon-dioxide in the environment. This led to the warming up of the earth's atmosphere called greenhouse-effect, which over a period would cause the polar ice-cap to melt. There would also be a reduction in the level of the oceans, causing the coastal areas to be flooded. There would also be a change in the weather pattern. "This is a real risk." Excessive use of chloroflurocarbons in aerosol sprays damaged the ozone layer. Burning of coal led to acidification of water as it happened in lakes in Norway and Sweden, affecting salmon fish. Acid rains also destroyed the health of forests.

Comparatively, nuclear energy had the problem of radioactive waste. But the public did not realise that radiation was always part of natural environment. The radiation levels within and outside a nuclear power plant in India were kept under control as per the guidelines of the International Atomic Energy Agency and the International Commission on Radiation Protection. The nuclear power plants in India had several barriers to release of radioactivity. Safety experts were associated with each nuclear installation from the stage of site selection, design, construction to operation. The lesson

of the Chernobyl accident was not to abandon nuclear power but to make it safer. Two committees appointed in India arrived at independent conclusions that owing to inherent safety characteristics and engineered features, an accident of the type that occurred at Chernobyl was ruled out in Indian nuclear power plants.

Mr R. Krishnamurthy, executive director, power sector (southern region), BHEL, Madras, paid tributes to the vision of Sir Visweswarayya, which was not confined to building dams or erecting steel plants. "He had the vision of people at large." Mr G.S. Shama Rao, former president, Association of Mysore Engineers, said it would institute awards for students of engineering courses, hailing from Karnataka and Tamil Nadu, Mr P.V. Sudhama, president, welcomed the gathering. Mr A.H. Kesari Prasad proposed a vote of thanks.

Soviet Team Visits Proposed Nuclear Power Site

51500029 Madras THE HINDU in English 18 Oct 89 p 4

[Text] Tirunelveli, 17 Oct—A high power Soviet team, consisting of Ministers for Nuclear Power and Industry and Foreign Economic Relations and officials, today visited the site of the proposed nuclear power project at Koodangulam in Tirunelveli district.

A 2,000 MW capacity nuclear power plant is being established at Koodangulam for which the Soviet Union is rendering a massive assistance. The delegation visited various areas of the site.

The 11-member delegation included Mr V.V. Maryin, First Deputy Chairman of the Bureau of the USSR Council of Ministers for Fuel and Energy Complex, Mr A.N. Protsenko, First Deputy Minister for nuclear Power and Industry and Mr A.A. Tritsky, Deputy Chairman of the State Planning Committee of the USSR.

The Tirunelveli Collector, Mr S. Rajarethinam and the additional collector, Mr P. Rama Mohana Rao, received the delegation at the project site. Mr C.R. Prabhakaran, project engineer (civil), of the Nuclear Power Corporation also accompanied them.

In view of the objections from a section of the people to the location of the nuclear power plant, extra security precautions were taken and the Tirunelveli range DIG of police, Mr V.C. Perumal, and the Kanyakumari SP, Mr Narendra Pal Singh, were at the project site. However, no unpleasant incident took place.

Increased Hazard Seen in Nuclear Plant Disposal

51500030 New Delhi PATRIOT in English 11 Oct 89 p 6

[Text] Jaipur, 10 Oct (PTI)—The disposal of atomic power plants after they outlive their "lives" may pose a bigger problem for the country than the hazard they present during their operation according to a veteran physicist.

Prof V.S. Talekar, director of the Dr Subhash Memorial Foundation here, said the first batch of the commercial atomic power generation plants were coming to the end of their useful lives, which is about 30 years.

The exact technology of decommissioning and safeguard against low and high level radiation of atomic wastes has not yet been effectively evolved, he added.

The cost of "burial" of the two units of the Tarapur Atomic Power plants, when they outlived their lives, would be around Rs 500 crore, Prof Talekar said.

The Rawatbhata units in Rajasthan would require Rs 750 crore for decommissioning. This cost is expected to double every five years, he added.

Prof Talekar said the country should go in for alternative sources of energy since nuclear power generation was neither safe, nor cheap nor economical.

These sources of energy including wind power, solar energy, hydrogen energy and anti-matter energy should be the targets of intensive research and technology development to supplement conventional sources of energy, he said.

Prof Talekar said he had written to Prime Minister Rajiv Gandhi and Union Energy Minister Vasant Sathe, urging them to abandon plans to commission new atomic power plants.

IRAN

Bushehr Nuclear Power Plant Nears Completion

LD1611191789 Tehran IRNA in English 1725 GMT 16 Nov 89

[Text] Bushehr, 16 Nov (IRNA)—One of the war damaged reactors of the Bushehr nuclear power plant has been completed by 90 percent, said head of the Atomic Energy Organisation Reza Amrollahi today. When ready, the power plant will supply one fifth of the country's electricity needs.

The Bushehr nuclear plans was targeted by Iraqi forces several times during the imposed war despite international laws banning attacks on atomic plants designed for peaceful use of nuclear energy.

IRAQ

Missile And Space Rocket Developments Announced

Satellite-carrier System Test

JN0712132889 Baghdad Voice of the Masses in Arabic 1136 GMT 7 Dec 89

["Text" of cable by Husayn Kamil Hasan, minister of industry and military industrialization, to President Saddam Husayn; date not given]

[Text] In the name of God, the merciful, the compassionate: Ye, assembly of Jinns and men! If it be ye can pass beyond the zones of the heavens and the earth, pass ye! Not without authority shall ye be able to pass. [Koranic verse]

My lord President, leader Saddam Husayn, may God protect you. On a previous occasion, when we provided you with one of the distinctive achievments of your men in the military industrialization, you wrote in your blessed hand these words: May God bless the efforts of the men whose will proved there is no longer anything impossible except what God Almighty does not want. They have become a model of hard work and an example of creativity for the Iraqis and Arabs.

As much as those words were a source for our pride, they were also a trust—that we measure up to your good opinion and keep up the good work. Any halt to the forward march is a retreat and regression.

My lord leader president: As your men in the military industrialization have pledged to you—that they will continue to give under the protection of your leadership and directives—they, after the achievement of victory and peace, used their creative capabilities and experience to manufacture long-range surface-to-surface missiles. Those were built and developed to defend the security and dignity of the nation. After this, they turned their faces toward space to support the scientific march for peaceful purposes, by using the available resources and at cheap cost.

With help from God Almighty, at 0830 [0530 GMT] on Tuesday, 7 Jumada al-Ula 1410 Hegira, corresponding to 5 December 1989, a new highly complex scientific and technological leap was achieved with the successful test launch of the satellite-carrier rocket system from the space research center at al-Anbar base. With the success of this test, the first phase of the space program we have been entrusted to carry out will have been implemented. The system is 25 meters long and consists of three phases. Altogether it weighs 48 tonnes. The total propulsion force of the first stage engines is 70 tonnes.

This great scientific achievement is the first product of the good efforts of groups of Iraqi scientists, engineers, and technicians who worked under and were supervised by Lieutenant General Dr 'Amir Hammudah al-Sa'di and who determined to accomplish the mission in record time and with the required accuracy. By this, the Iraqis prove yet again that possession of science and knowledge is not exclusive to certain countries and on which they can have a monopoly. Science is God's gift to man, attainable by those who have the will and belief. Their early ancestors were pioneers in laying the rules of science and knowledge from which the whole of humanity has benefited, and from whose resources humanity is still benefiting.

We pledge to you, my lord president, the leader of of the great victory, and to our great people and our Arab nation that we will continue to carry out the space program and endeavor to implement all our other programs in the other fields. May God protect you as symbol of great Iraq and backer of our people and glorious nation. Success comes from God, my lord and great leader.
[Signed] Husayn Kamil Hasan, minister of industry and military industrialization

2,000-km Range Missiles

JN0712133389 Baghdad Voice of the Masses in Arabic 1230 GMT 7 Dec 89

["Text" of cable from Husayn Kamil Hasan, minister of industry and military industrialization, to President Saddam Husayn; date not given]

[Text] In the name of God, the merciful, the compassionate. When thou threwest a handful of dust, it was not thy act, but God's. [Koranic verse]

My Lord, the president leader, may God preserve you. Your men in the military industry made a promise to you, and they have fulfilled their promise. With your support and under your guidance they have been the striking arm of the Armed Forces—the Armed Forces' long arm, protective shield, and alert eyes.

My Lord, the president leader, in continuation of this course, your men the scientists in the military industry, headed and supervised by Lieutenant General Dr 'Amir al-Sa'di, have come through the most complicated and important stages in the development and production of two different surface-to-surface missile systems, each of which has a 2,000-km range. They did it with their own efforts and without any assistance from non-Iraqis. With this, the deterrence capabilities of Iraq and the Arab nation have been enhanced to enable great Iraq to enjoy peace and prosperity following the manifest victory. Let the covetous Arab nation's enemies learn a lesson from this.

We pledge to you, the leader of victory and peace, to be loyal soldiers and to pursue our offering under the canopy of your leadership and directives. May God preserve and guide your steps as a symbol of great Iraq and as an asset of our glorious nation. God grants success.
[Signed] Husayn Kamil Hasan, minister of industry and military industrialization

Saddam Comments on Test

JN0712150489 Baghdad Voice of the Masses in Arabic 1300 GMT 7 Dec 89

[Text] Leader President Saddam Husayn has praised the solid will of the honest men of military industrialization—the will that stems from a deep belief in God, the people, and the homeland. This came in his excellency's comment on the cable from the minister of industry and military industrialization in which he conveyed the good news of the successful test launch of the satellite-carrier rocket. Following is the text of the leader president's comment:

In the name of God, the merciful, the compassionate. Of faithful men of military industrialization: Blessed be

your solid will stemming from a deep belief in God, the people, the homeland, and the right to choose a free path to please our people and nation, whose prominent achievements will constitute a base for further progress, and to safeguard their rights with an enlightened mind.

God is great.
[Signed] Saddam Husayn, 7 December 1989.

TV Broadcasts Launch

JN0712183889 Baghdad INA in Arabic 1745 GMT 7 Dec 89

[Text] Baghdad, 7 Dec (INA)—Baghdad television tonight showed a film on the launching of the satellite-carrier rocket system from the space research center at al-Anbar base. The film shows the moments that preceded the launching of the system. The three-stage rocket is 25 meters long and weighs 45 tonnes with first-stage 70-ton-propulsion engines.

Millions of Iraqis saw the exciting moment when the rocket system was launched into outer space amid shouts of joy and admiration for the capability of the Iraqi scientists who made this great achievement.

Iraq announced today it had developed two different surface-to-surface missile systems, each of which has a 2,000 km range.

U.S. Remarks Criticized

JN1012112689 Baghdad INA in English 1015 GMT 10 Dec 89

[Text] Baghdad, 10 Dec (INA)—AL-JUMHURIYAH daily of Baghdad today criticised the statements of the U.S. state secretary spokesman which expressed the United States concern over Iraq's acquiring of a rocket system capable of putting satellite into orbit.

A daily article here today described the American concern as illegitimate and lacks realistic subjective justifications in addition to implying intentions over Iraq's ambition for further scientific and civilizational progress.

It stressed that this concern would not minimize the Iraqis or the Arabs joy over this great accomplishment or prevent Iraq from acquiring scientific capabilities and employing them for peaceful services leading among which is self-efficiency for legal defence of national sovereignty against any foreign aggression.

The Iraqi daily questioned about similar American concern when the aggressive Zionist entity launched its rocket in September 1988 and which carried a satellite to the outer space which was suspected of having suspicious aggressive purposes against neighbouring countries.

The daily also questioned about any international law or charter distinguishing Iraq from several other countries possessing advanced scientific capabilities adding that this privilege should be in favour of Iraq especially when Iraq did not manufacture an offensive atomic bomb or dropped such a bomb on densely populated areas.

It said that this big accomplishment realized by Iraqi scientists and engineers was a scientific add [as received] that should be a source of pleasure to all those seeking progress and welfare in the world.

The English language 'BAGHDAD OBSERVER' said that the repercussions of Iraq's new space rocket and 2,000-KM range surface-to-surface missiles, raised the eyebrows of many military observers throughout the world, while anti-Iraq circles tried to cast doubt over the Iraqi technological leap. Such people appear ignorant of the characteristics of the Iraqis. The grassroot Iraqi lives with a conviction that in the current world, the big fish swallows the small fish—and life gave the Iraqis more than an example to this truthful conviction.

Moreover, the Iraqis boast being the nation who taught mankind its first civilisation—that of ancient Mesopotamia. The Iraqis also were the first to raise the banner of Islam some 1,400 years ago when they spread the then new revolutionary religion to Persia, the Middle East, Asia and Europe. A nation with such a rich civilisational background cannot be intimidated easily.

In terms of technology, the Iraqis are coming as a power that must be taken into account. No real independence can be achieved without mastering technology.

Husayn Names Systems

JN0912114389 Baghdad INA in Arabic 1125 GMT 9 Dec 89

[Text] Baghdad, 9 Dec (INA)—President Saddam Husayn has issued an order conferring the name of "al-'Abid" [the worshipper] on the satellite-carrier rocket system to praise and thank God for the success and victory he bestowed on Iraq and the Arab nation in this prominent scientific field. His excellency also issued an order giving the name of "Tammuz-1" to the 2,000-km-range missile after the month of July [tammuz], the month of giving, well-being, and revolution.

Foreign Minister Comments

JN1312211889 Baghdad INA in Arabic 1900 GMT 13 Dec 89

[Excerpts] The United Nations, 13 Dec (INA)—Tariq 'Aziz, deputy prime minister and foreign minister, has declared Iraq had welcomed the mission of Jan Eliasson, special envoy of the UN secretary general, and cooperated with him in good faith.

At a news conference at UN Headquarters, 'Aziz said Iraq had addressed several questions to the Iranian Government through the UN envoy on major issues concerning the settlement with the aim of better understanding the Iranian stance. 'Aziz added Iraq sought to tackle the pressing issues concerning peace, as the 16

months following the cease-fire agreement has not brought us any closer to peace. [passage omitted]

In reply to a question on the successful test launch by Iraq of a satellite-carrier rocket system, Tariq 'Aziz said this scientific accomplishment is designed for peaceful purposes. He added Iraq, like other nations, has the right to acquire technology and use it for peaceful purposes.

On Iraq's development of a missile system that has a range of 2,000 km, the foreign minister said: We have to take our defense needs into account, as Iraq still is threatened by Iran. We still are in a state of no-war, no-peace. Besides, the Iranians have not demonstrated sufficient readiness to achieve a comprehensive and full peace. Consequently, we will do our best to acquire the necessary defense equipment required to defend our country in case the other side contemplates the resumption of hostilities.

Paper Denounces U.S.

JN1312114489 Baghdad INA in English 1020 GMT 13 Dec 89

[Text] Baghdad, 13 Dec (INA)—AL-THAWRAH daily of Baghdad denounced the U.S. Administration stance versus Iraq's success in launching rocket al-'Abid capable of putting satellite into orbit.

The paper was surprised over the U.S. silence versus what was taking place in nuclear reactor Dimona which produces atomic bombs according to many sources including the American one.

The paper stressed that the United States had wanted to protect its interests by securing the Zionist entity's occupation of the Palestinian territories and the continuity of this occupation.

The paper referred that the key American goal was to stamp out the Palestinian surging uprising which started stirring up anxiety of the U.S. Administration.

ISRAEL

Government Reacts to Iraqi Missile Threat

Called 'Serious Matter'

TA0812115289 Tel Aviv MA'ARIV in Hebrew 8 Dec 89 p A2

[Report by Shefi Gabay]

[Excerpts] Iraq yesterday announced that its space scientists have launched a three-stage rocket which can carry a satellite into space for peaceful purposes. [passage omitted]

A senior security source in Israel stressed that "this is a serious matter," pointing out that "Iraq has now assumed a place at the forefront of Middle East technology. As opposed to the Syrians and Saudi Arabians, who purchased old-fashioned missiles from the PRC, the Iraqis enlisted the aid of scientists from Western Europe, mainly from the FRG."

The source asserted that "if the reports from Baghdad are true, the Iraqis have missiles that can be launched from any corner of Iraq and cover the entire territory of Israel." The source claimed that "the reports from Baghdad are being taken very seriously in Israel, and we are monitoring developments. This is a whole new dimension, which gives Iraq greater maneuverability and disrupts Israel's early warning capability." [passage omitted]

'Close Watch' on Iraq

TA2012102489 Jerusalem Domestic Service in Hebrew 1000 GMT 20 Dec 89

[Text] Defense Minister Yitzhaq Rabin said in the Knesset that Israel is maintaining a close watch on technological developments in Iraq, especially on medium- and long-range surface-to-surface missiles, on its entry into the space age, and on nonconventional weapons. The minister was answering a query by Knesset member Hanan Porat on the launching of the Iraqi missile. Rabin said we cannot dismiss the technological capability of Iraq or other Arab countries.

PAKISTAN

Air Force Officer on Kahuta Security, Exercises

BK2711014689 Hong Kong AFP in English 2301 GMT 26 Nov 89

[Excerpt] Islamabad, Nov 27 (AFP)—Pakistan has beefed up security at a key nuclear facility to safeguard it from external threats, a top official said here.

Air defences have been "sufficiently strengthened" around the Kahuta plant near here, said Air Vice Marshal Baharul Haq on Sunday [26 November].

He said though Pakistan and its traditional rival India had agreed not to attack each other's nuclear installations, "the Air Force was alert around the clock to check any intruder." The Kahuta nuclear facility holds a uranium enrichment plant. [passage omitted]

Agreement Signed to Transfer Technology from PRC

OW0412184789 Beijing XINHUA in English 1655 GMT 4 Dec 89

[Text] Islamabad, 4 Dec (XINHUA)—The signing of the agreement between Pakistan and China on the supply of a 300-megawatt nuclear power station is a landmark and significant development in transfer of technology to Pakistan, chairman of the Pakistan Atomic Commission Nunir Ahmed Khan said today.

Talking to reporters in Karachi, the largest city in Pakistan, Ahmed Khan said that the supply of the nuclear power station by China is a new start in Pakistan's nuclear program held in abeyance for the last several years.

The project was announced by Chinese Premier Li Peng when he visited Islamabad last month.

Ahmed Khan said that Pakistan's nuclear program was delayed because Western developed countries had imposed an embargo on the purchasing of equipment for building nuclear plants.

He noted that with the display of noble and friendly gesture by China, the Western countries will have to bring a change in their attitude towards Pakistan as far as its nuclear development program is concerned.

He pointed out that the plant is the first example of cooperation between two Third World countries in this field. This will also project China internationally in the field of nuclear technology, he added.

Ahmed Khan said that after finalizing preliminaries with China, work on the construction of the project will begin next year, and it is expected to be completed within six years.

Pakistan set up its first 137-megawatt nuclear power plant near Karachi in 1977.

Commentary Hails Nuclear Plant Deal With China

BK2211053189 Islamabad Domestic Service in English 1600 GMT 21 Nov 89

[Syed Nazir Bukhari Commentary]

[Text] The Chinese prime minister, while visiting Pakistan recently, himself announced that the government of the People's Republic of China had agreed to give Pakistan a nuclear power plant of 300 megawatts capacity. The prime minister had explained that the nuclear plant was being provided to Pakistan under an understanding already reached between Pakistan and China for using nuclear energy for peaceful purposes. He also pointed out that the details of the agreement will be settled in due course of time and that the nuclear plant would operate under the safeguards of the International Atomic Energy Agency.

As far as Pakistan is concerned, its getting a nuclear plant from a friendly country like China is most significant. It is significant in the sense that now after almost 30 years Pakistan would be able to get another nuclear plant after she received the first one from Canada in the early 1960's. Pakistan, which has been operating the Karachi nuclear plant under the strictest international safeguards, suddenly found itself hampered in its efforts of using energy for peaceful purposes when in 1974, under the impact of the Indian nuclear explosion, Canada stopped supplying nuclear fuels to Pakistan, punishing this country for acts committed by others. Since then, an international campaign was set in motion for stopping any supply of nuclear fuels to Pakistan. Also (?strict) discriminatory and unjust conditions were put on Pakistan for getting these restrictions removed. Even impediments were created in the way of Pakistan for receiving nuclear know-how and training. It goes to the credit of Pakistan that while it never succumbed to the harshest and unjustifiable conditions, at the same time, it continued its course of using nuclear energy for peaceful purposes. The conjectures of international propaganda that Pakistan would explode its experimental nuclear bomb any time proved false always during the last 15 years.

Against this background, China agreeing to supply Pakistan the nuclear power plant should be considered as an achievement of the country. The chairman of the Pakistan Atomic Energy Commission has also thrown some light on this agreement. He has said that the Chinese decision is a great tribute to the present government as in the past it was essentially political difficulties that stood in the way of Pakistan getting the nuclear plant. According to him, it is an important breakthrough and will give impetus to the nuclear power program of the country. It will be the first nuclear power plant to be exported by any developing country to another developing country. The agreement does not contravene Pakistan's stand on nuclear policy which it has pursued since 1974. On the contrary, it vindicates Pakistan's stand that she would not accept any political pressures. He also hinted that more such agreements would be possible. This Chinese nuclear power plant to be constructed at Chashma Barrage will be commissioned in 1996. It will be protected under the international safeguards as to ensure its peaceful use and indicate to all that it was under international inspection.

The Pakistan-China nuclear power plant agreement is a breakthrough for Pakistan as it will prove to the world that Pakistan is only interested in the peaceful use of nuclear energy, as it is not economically feasible for the country to meet its energy requirements by conventional methods. The Chinese know-how the Pakistani scientists and engineers would receive would add to their knowledge and help the country in updating its nuclear skills. However, as pointed out by the chairman of the Pakistan Atomic Energy Commission, the envisaged acquisition of the nuclear plant is just to show a [word indistinct] to growing energy needs of the country and that Pakistan would continue its efforts of achieving self-reliance in the nuclear field.

Poor Nuclear Plant Safety Planning Alleged

904E0018A Moscow TRUD in Russian 27 Oct 89 p 2

[Letter to the editor of TRUD: "Allow Me To Disagree"]

[Text] For many years I have been working for the Odessa Center for Metrology and Standardization (CMS) in the Department of Radiation Control. I, as well as my colleagues from the Southern-Ukrainian AES [Atomic Power Station], chanced to come across an incredible irresponsibility in the area of radiation safety and control. At first I thought that such a situation existed only there, but after I had worked 2 years at Chernobyl, I came to the conclusion that such phenomena at AES's are quite typical. More than once I wrote to Minenergo [Ministry of Power and Electrification] to describe the outrageous abuses of the systems of reactor shielding and control and in-pile and radiation control.

It is my knowledge that not a single project of an AES had undergone any testing for ecology, metrology, or any specific purposes. In Rovno, for instance, there is no efficient control of radioactive wastes. The RK (Kalina) system that they use can produce data only at the time of an accident. My statement seemingly questions the positive conclusions given by a special commission of the International Atomic Energy Agency about the control systems at that particular station. However, it seems to me that the commission's members either used indirect information, or the given information was improperly presented to them.

I am not against nuclear power stations, as you might think, but I am against their design, not to mention the quality of their equipment. The Southern Ukrainian station is in a state of permanent turmoil: It has constant leaks in all of its steam generators. Systems of radiation data and measurements were not tested as they were designed and installed. Therefore it is a technological impossibility to provide a periodic metrology check.

[Signed] A. Starishch, chief of the Department of Radiation Control Measurements for the Center of Standardization and Metrology. Odessa.

THE TRUD LETTERS-TO-THE-EDITOR DEPARTMENT deemed it necessary to clarify the point of view of those who were criticized by A. Starishch. Here is what we were told in the Department of Radiation Control of Gospromatomnadzor [State Inspection of Atomic Power] of the USSR.

State metrology inspection at nuclear power stations is done by the Centers for Standardization and Metrology of Gosstandart [State Standardization Agency] of the USSR. A. Starishch works in one of these. Last March he refused to take part in a scheduled inspection tour of the Southern-Ukrainian AES, even though he had been included in the inspecting committee.

As for the AES designs which include reactor VVER-1000 (Southern Ukrainian, Zaporozhskaya, Khmelnitskaya, Balakovskaya, Kalininskaya—all in all, 14 power generators), they all have undergone general tests for Gosstroy [Central State Construction Agency] of the USSR, Minzdrav [Ministry of Health] of the USSR, Gospromatomnadzor [State Inspection of Atomic Power] of the USSR, and departmental tests for Minenergo [Ministry of Power and Electrification] of the USSR, the USSR State Committee of Science and Technology, and the USSR State Committee of Prices.

It is true that the aforementioned projects have not been tested for metrology. For that, our agency is responsible, together with some others. So the author of the letter is quite correct in that regard, but he himself is also responsible for the state inspection over nuclear power stations in his region. It is in his jurisdiction to examine power stations both active and those under construction, to report about elimination of "outrageous abuses" and to stop the trend of "incredible irresponsibility." That, for instance, is the usual practice among state inspectors of the Khmelnitsky Center of Metrology and Standardization. There is not much progress yet: Metrological equipment is expensive and there is no money. (For information purposes: A power generator with a VVER-1000 reactor costs R300-500 million rubles. A similar generator in another country—the United States, France, the FRG—costs $1.5-2.5 billion and they also allocate considerable amounts of money for metrological equipment.)

As for the Kalina unit for air quality control, it may be said that it provides rather adequate information about radionuclids both gaseous and aerosol. Apart from that, lately the new stations have been equipped with improved units.

And, finally, one can hardly judge the methods of the International Atomic Energy Agency experts' work without knowing their programs. According to our information, they had access to the type of data on Soviet AES' which are not always disclosed to every specialist.

Northern Regions' Nuclear Test-Related Illnesses Refuted

90WP0014A Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Nov 89 p 3

[Article by SOTSIALISTICHESKAYA INDUSTRIYA correspondent V. Androsenko and TASS correspondent G. Krasnogor, Magadan, under rubric "According to Rumors and Reliably": "Why Lay It on Thick?"]

[Text] All the representatives of the northern nationalities suffer from tuberculosis; 90 percent are affected by chronic diseases of the lungs; cancer is rampant in Chukotka. This ominous information was cited recently in MOSKOVSKIYE NOVOSTI newspaper by USSR People's Deputy Ye. Gayer and Doctor of Medical Sciences V. Lupandin. "Chernobyl in Chukotka" was the

title of their article. The conclusion from the article—"the peoples of the North are paying for the nuclear tests"—which was made in the subtitle, has extremely disturbed the residents of the North who are still healthy. We decided to analyze the situation. First, where did this information come from? It is no secret. The sources have been indicated.

The authors of this article were told by a certain village soviet chairman that practically the entire population is suffering from cancer. True, there was no indication of his name, and therefore we shall leave these terrible generalizations to the conscience of the anonymous informant. Let us consider, then, testimony that has been better documented.

The reason for the catastrophic situation is the increased radiation background in Chukotka, the authors of the article assert. The background is the consequence of the nuclear tests that were conducted in the atmosphere in the Far North in the 1950's and 1960's. This conclusion, they assert, evolves from the findings of the Leningrad Scientific-Research Institute of Radiation Hygiene (LenNIIRG).

Well, associates of that institute in the early 1970's actually visited the Chukotka that was for them so remote and they carried out random research. Since that time, the northerners did not see them any more. And then, last year, the Leningrad institute remembered them again. Why did that happen all of a sudden? There is no need to puzzle over this for long: LenNIIRG had changed over to the new management methods—it needed economic-contract injections. In the search for them, the institute management sent a letter to the administrators of the autonomous okrug. And it simply terrified them. We have seen that letter—attempting to encourage the northerners to cooperate, the specialists had not spared the gloomy paint, mixing it in with the paint of years that passed long ago.

But this is the opinion of people who have engaged in the problems of the northern nationalities not episodically, but constantly:

"There are discrepancies in your data and and the research conducted by the okrug hospital," Yu. Bulgakov, chief physician in Chukotka Autonomous Okrug, for example, notes in his reply to the institute.

"And how could there fail to be such discrepancies," A. Volfson, candidate of medical sciences, head of the Laboratory of the Ecology of the Nationalities of the North, Institute of Biological Problems of the North (IBPS), asks. "The Leningrad scientists, and then the authors of the sensationalistic article, cited the results of my very own research in the 1959-1975 period."

But since that time the situation has considerably changed for the better. In particular, according to data provided by the IBPS Laboratory of Human Genetics, at the present time the average life expectancy among the northern nationalities is approaching 55 years. Of course, that leaves much to be desired, but nevertheless it is not the 45 years indicated in the article. In recent years there has also been a considerable drop in the level of infant mortality. However, neither Ye. Gayer nor V. Lupandin made any inquiry of the Magadan scientists. Apparently they needed only that data that would confirm the chief postulate in the article: by their health and by their life itself, the northern nationalities are paying for the testing of nuclear weapons in our country.

Obviously, the Leningrad researchers themselves had not expected such a strong generalization. LenNIIRG director, Doctor of Medical Sciences P. Ramzayev writes, "While supporting the article for the concern that it expresses for the state of health among our local inhabitants, I cannot fail to note its tendency toward the use of excessive hyperbole with regard to a number of points, unfortunately, that led to the distortion of the essence of the matter."

The authors of the articles, the scientist remarks, furnish distorted information concerning the sources of the increased background, because the nuclear tests were conducted not only in our country. Why, then, heap everything on the USSR? In addition, no less a contribution to increasing the radiation in the Far North is also made by natural sources.

"The institute's findings," P. Ramzayev continues, "do not confirm that the entire disease rate in Chukotka is 'testimony to the effect of radiation.' That is a great exaggeration. We only call for research on its role, feeling that that role is unknown... The disease rate of the indigenous population in all areas of the Far North is approximately twice the average rate for the USSR. The reason for this is unknown to us. It must be studied."

Of course it must be studied, and no one will dispute that. Research carried out by the Radiology Laboratory of the oblast's sanitation and epidemiology station confirm that the specific radioactivity in reindeer meat is much higher than, for example, in beef or pork. But it is 100 times less than the maximum admissible concentrations established by USSR Minzdrav [Ministry of Health] for meat products. As for the gamma background in Chukotka, it does not exceed the natural values and constitutes 15-20 microroentgens per hour—no more than in many other parts of the country. To speak, under such circumstances, of the fatal effect of radiation and to see in it the cause of all diseases means departing from the truth.

"As long ago as the 1940's, when nuclear tests were not even being talked about, Danishevskiy, the founder of our domestic polar medicine, noted the increased disease rate for cancer of the esophagus among the indigenous inhabitants of the North," A. Volfson says. "At that time he mentioned the hypothetical causes: the alternation of hot and cold food, the eating of raw food."

One might also recall the pre-revolutionary testimony provided by researchers. Descriptions of terrible epidemics that devastated entire nomad camps are still in existence. It was at that time that the first fears for the

fate of the northern nationalities appeared. It was predicted that they would become extinct. The Soviet authority—whether or not people want to admit this—saved the northern aborigines from their tragic fate.

The situation with the northerners' health, with their life expectancy, continues today to be rather dramatic. But the figures that are being used by the Magadan scientists and doctors are considerably lower than those mentioned by Ye. Gayer and V. Lupandin. The tuberculosis rate among the indigenous population is 5 times higher than the rate for the oblast as a whole. But it is by no means 100 percent, but only a few percent.

The reasons for the increased disease rate among the northern nationalities must be found by the scientists and the medical workers on the basis of the complete and careful study not only of the social conditions, but also the peculiarities of the aborigines' organism and its immune genetic system. This requires first of all a data bank consisting of extensive, thorough, and reliable data.

Unfortunately, the creation of a data bank like this is still far away. Dozens of expeditions come to Chukotka every year, but the sad crux of the matter is that they carry their material away with themselves, frequently failing to share their research results with anyone. Then, somewhere back there "on the mainland," on the basis of the collected data, they defend numerous dissertations and confirm the topics of scientific projects, but the Chukotkans and the Eskimos are kept completely uninformed about this. Isn't it time for all the research results obtained in the Far North to be accumulated where those results are needed? Shouldn't they be made the property of the physicians there?

Concrete actions are extremely necessary today. They are necessary to resolve not questions that have been made up, but genuine problems. We have in mind improving the everyday life of the reindeer breeders, who roam like nomads year round with their sovkhoz herds across the tundra. We have in mind providing them with warm national clothing and with proper nutrition. Much will also have to be done to improve the medical services. We must be concerned about developing small businesses. One recommendation that has a very topical sound is the recommendation that the nationalities of the North return—within intelligent limits—to their traditional way of life, without, of course, erecting a high wall to fence them off from the achievements of civilization. Contributions to implementing these and many other acute problems can be made both by people's deputies and by scientists, including the esteemed Ye. Gayer and V. Lupandin. If, of course, they follow their own appeal, as sounded in their article, it is necessary to transfer this discussion to the soil of realistic affairs, where the first step must be glasnost and the objectivity of the data. It is possible to lay it on thick, but in such a way that the paint does not smear the real picture.

Spread of Missile Technology Discussed

PM1912190189 Moscow PRAVDA in Russian 19 Dec 89 Second Edition p 4

[Vl. Kuznetsov article under the rubric "Discussion Platform": "Some Missiles for Scrap. But Others?"]

[Text] Our stormy world is changing from day to day. Nevertheless, it quickly gets used to everything. The unusual becomes usual. Yet the sight of human hands destroying the most modern and sophisticated missiles, which they themselves created, is an outstanding event notwithstanding. Only recently such a thing seemed like a fantasy.

But today we are witnessing real nuclear disarmament in action, the elimination of Soviet and U.S. intermediate-range and shorter-range missiles.

But thoughts are willy-nilly already turned to something else. To the fact that there are still more terrible missiles—strategic, intercontinental missiles. Will the same fate befall them as that prepared for their "younger sisters?" The work in Geneva on a Soviet-U.S. agreement to reduce strategic offensive arms by half is in full swing, and millions of eyes are expectantly following it. There are also tactical nuclear missiles, which, despite their more "modest" parameters, could cause a great calamity in Europe. There is no change as yet on the question of reducing them, but a debate is taking place on this topic—a fact of considerable significance in itself.

However, there will not be complete security, stability, or peace in the world while the arms race, which is being or could be dammed in some directions, is spreading in others. Including the so-called "side" channels. What do I mean?

Until recently only a few powers were members of the "missile club." Today at least 15 states aspire to a seat in it. They are mainly "Third World" countries located in zones of present or potential conflicts. The missiles in these unstable zones are already becoming a means of waging war, and they were used on the Iran-Iraq front, for example.

No other region of the planet is in the grip of missile fever to such a degree as the Near East.

Back in 1961 Israel launched its first missile. In 1987 it tested the "Jericho-2" missile, whose range makes it possible in principle to strike at the capitals of the majority of Arab states and even at southern Soviet cities. In the fall of 1988 the first Israeli satellite was put into orbit with the help of a Shavit [name as transliterated] carrier, which is classed as an ICBM and can be adapted to deliver a nuclear warhead. Israel has an arsenal of U.S. Lance surface-to-surface missiles. According to USSR Defense Ministry data, a ballistic missile with a range of 1,300 km was launched from the Jerusalem region in September. It is Tel Aviv that has become the epicenter of the missile epidemic in the Near East.

According to foreign press data, Saudi Arabia has purchased a consignment of Chinese intermediate-range missiles. Kuwait, Libya (which has Soviet-made short-range missiles called Scud and is conducting joint developments with Brazil to create missiles with a range of 600 km), and also Iran, which is manufacturing its own tactical missile and a missile with a range of 800 km utilizing Chinese technology, would also like to possess these Chinese missiles. In the spring of this year Tehran tested a new surface-to-surface missile with a range of 200 km. Iraq is cooperating with both Libya and Brazil to create a missile with a range of 300 km. Syria has Scud missiles in its arsenal in addition to SS-21's. Egypt possesses several types of imported missiles as well as its own. Jointly with Argentina it is developing a missile system known by the name of Condor-2 (a potential counterweight to the Israeli Jericho-2).

A modification of Jericho-2 was tested this summer on a range in the Republic of South Africa. Its range of 1,500 km enables it to hit targets on the territories of neighboring states. According to reports from Western sources, South Africa and Israel have also conducted the first joint tests of strategic missiles.

As General Mirza Aslam Beg, chief of staff of Pakistan's ground forces, declared recently, in January-February 1988 his country conducted tests of two types of missiles with ranges of 80 km and 300 km. Pakistan has purchased a consignment of ballistic missiles from China.

The first test launch of the Agni [name as transliterated] missile with a range of up to 2,500 km was carried out in India in May 1989. The commissioning of various tactical missiles is drawing near.

South Korea has improved the U.S. Nike Hercules missiles by increasing their range.

These are the individual brush strokes making up the overall picture. Everything in it has gotten mixed up as a result of numerous bilateral and multilateral missile projects, including ICBM's.

A universal passion for missiles is in evidence. There are more than enough carriers of various types. But what kind of charges are they designed for, and what can they be equipped with? The Negev Desert has sheltered a secret Israeli nuclear installation. The nuclear research complexes at Valendaba [name as transliterated] and Pelindaba are hidden in South Africa's Transvaal Province, and there is a test range in the Kalahari Desert. A Pakistani nuclear center is concealed in deserted hills at Kahuta, near Rawalpindi. It is in precisely these complexes that preparations are being made to cross the "nuclear threshold." Perhaps it has already been crossed in some places. There are many guesses and suppositions on this score, as well as computations, calculations, and evidence.

When we speak of a "major" war, it usually occurs to us that it might flare up between the USSR and the United States. Or in Europe. But the threat of such a conflict has now been set aside and is becoming less likely. On the other hand, there are ever-increasing grounds for concern that the irremediable might happen in the "third world."

Universal attention is now turned to the talks in Geneva and Vienna. It is right there, it is believed, that historic decisions must be adopted which will halt the slide toward a nuclear auto-da-fe. This is undoubtedly so. But other potential hotbeds of danger must not be underestimated either. This is the very time to place under unremitting control all vulnerable spots on the global strategic landscape, all points and regions of risk. The spread of missiles and missile technology is becoming a most acute problem for the world community. Moreover, one of the problems connected with mankind's survival.

It cannot be said to be entirely outside the field of view of governments and states. The first Soviet-U.S. consultations on this range of questions have taken place. In April 1987 the United States, Britain, France, the FRG, Italy, Canada, and Japan reached agreement on limiting the transfer to other countries of technologies and equipment which contribute to the development of unmanned nuclear weapon delivery systems. It was undoubtedly a timely and useful agreement, although the number of parties to it could be wider, and resourceful firms and slick operators very often circumvent the agreement itself.

Yet, in my view, more vigorous efforts are needed to neutralize the threat. Above all, efforts by the five nuclear powers, but also by the United Nations and other international organizations. The Treaty on the Nonproliferation of Nuclear Weapons was signed in 1968. Despite all the complexities of its realization, it serves its proclaimed aims well. This is undoubtedly an example also for the establishment of reliable obstacles to the "missile epidemic."

The Soviet Union believes that the problem of the proliferation of missile weapons and their transfer to zones of heightened confrontation is ripe for discussion on both a bilateral and a multilateral level. It is complex: It is necessary, on the one hand, to stop the geographic spread of combat missiles and the attendant technology and, on the other, not to infringe the legitimate interests of countries which seek to secure peaceful access to space. Nevertheless, it seems that even now there are real possibilities of ending the practice of unlimited and uncontrolled international weapons deliveries. It is best to resolve this problem, like others, in light of glasnost and openness. The USSR is ready, in particular, to participate in the creation at the United Nations of a register of sales and deliveries of weapons, including drawing up its parameters.

As for the United States, it can unfortunately in no way rid itself of contradictoriness and duplicity in its position. Both the president and the secretary of state campaign in many speeches for "strengthening the regime of control over missile hardware." At the same time Washington is arming the Afghan opposition with Stingers, supplying Pakistan with F-16 aircraft, which are easily adapted for transporting nuclear warheads, and creating a ballistic missile together with Israel.

According to CIA forecasts, by the year 2000 at least 15 countries will be producing ballistic missiles. Washington asserts that it is very concerned at this and intends to block such trends. From time to time it makes representations to other countries from where leaks of missile technology and weapons component equipment occur in roundabout ways, with the help of straw men. And Washington itself? As THE WALL STREET JOURNAL reported in August this year, the Senate Governmental Affairs Committee had to enquire into three very important military laboratories—Los Alamos, Livermore, and Sandia—from where, it is believed, countries working on secret programs to create nuclear weapons had obtained secret information.

The spread of missiles in zones of instability and tension could seriously hamper and even undermine the process which has begun of settling regional conflicts. Further real nuclear disarmament could also be complicated. Because, if more and more states acquire missiles, it cannot be ruled out that people will have to give the matter some thought: Under these conditions should we scrap our own?

We are now driving missile weapons out of the door, but this monster is threatening to climb back in through the windows which remain without reliable surveillance in various parts of the globe.

It is known to be easier to cure any disease before it is allowed to develop unchecked.

Nuclear Energy Program Encounters Difficulties

AU2911202489 Warsaw ZYCIE WARSZAWY in Polish 21 Nov 89 p 5

[NOVOSTI article 'special for ZYCIE WARSZAWY' by Yuryi Kanin, NOVOSTI Science correspondent: "Uncertain Fate—Nuclear Energy in the Soviet Union"]

[Text] The Soviet nuclear power industry is in a state of crisis. The disaster at Chernobyl had a profound psychological effect on the whole country, and all development projects in this industry have been shelved for the time being.

After the catastrophic earthquake, the nuclear powered electricity station in Armenia was shut down, even though that station did not suffer any effects from the underground cataclysm. Following demands by seismologists and the protests by public opinion, all design, project, and construction work was halted on the nuclear power stations in Azerbaijan, Georgia, the Krasnodarskiy Oblast, and the thermo-nuclear power stations in Minsk, and Odessa. During those days, decisions were made to redesign the Crimean nuclear power station that was being constructed in this holiday resort area in the south of our country. This will now become a training station for personnel from other nuclear power stations. The current session of the Supreme Soviet has also decided to suspend work on the Chigirin nuclear power station, although there is as yet no official document on this matter. In Bashkir and Tartar the local authorities and the people of these autonomous republics have protested against similar local projects. In this way, owing to the accident at Chernobyl, there is now a lack of 30 million units of power [as published] which were planned for (to be produced by nuclear power stations). Providing a supply of electricity throughout the country is becoming more difficult. Both people and local authorities are protesting against the construction of nuclear power stations, as well as coal-powered, and even hydroelectric power electricity generating stations, on their territories. Everyone wishes to obtain electricity from his neighbor—stated the Minister of Energy at the recent meeting of the Supreme Soviet. The Planning Committee of the USSR Council of Ministers hopes to present a new energy program for the country before the end of this year, but it is already becoming doubtful whether the Supreme Council will accept the new program.

That is why—I was informed by Viktor Sidorenko, deputy chairman of the USSR State Committee on Security Controls in Nuclear Energy Construction, and corresponding member of the Soviet Academy of Sciences—we are also preparing other and parallel energy programs which are being elaborated by separate individual groups of scientists of the Soviet Academy of Sciences.

In your opinion what place in these programs should go to nuclear energy—I asked Viktor Sidorenko?

First, I would like to explain what place it occupies today—answered Sidorenko. In the USSR today there are 15 nuclear powered electricity generating stations which have a combined output of 33 million kilowatts. These power stations account for about 12 percent of our total power output and it is difficult to imagine how we could replace this. I simply do not believe that we can develop economically without nuclear energy. Of course the amount of projected electricity will not be what we previously planned (before the accident at Chernobyl we were projecting the construction of 40 nuclear power stations throughout the Soviet Union, before 1995). At present, the rate of increase of our actual needs—which are already proving difficult to satisfy—will require that we double the amount of power that we obtain from nuclear power stations within the next 20 years.

Viktor Sidorenko also stresses the fact that the current Soviet nuclear energy program is now based on pressure water reactors. Very strict security controls are applied to these, including the so-called means of controlling unexpected chain of occurrences. There is now a whole package of technical aids which are capable of reducing the effect of any accident which occurs as a result of an unexpected sequence of events in the power station.

Society has already been informed about all these new security measures which have been instituted in nuclear power stations. Nevertheless, people still refuse to believe that an accident like the one at Chernobyl could not happen again, and until they regain that confidence, the fate of the USSR nuclear energy program remains uncertain.

EUROPEAN AFFAIRS

EC Updates Nuclear Energy Statistics, Outlook

89AN0356A Brussels EC INFORMATION MEMO in English No P-46 27 Jul 89 pp 1-3

[Article: "Energy: The Nuclear Components and Equipment Industry and the Outlook for 1992"]

[Text] In 1980, electricity produced from nuclear energy accounted for slightly less than 12 percent of total Community electricity production (overall figures for the Twelve).

In 1988, the share of nuclear energy in total electricity production in the Twelve had increased to nearly 34 percent.

These figures reflect very different situations within the Community. In 1988, only six countries produced electricity of nuclear origin: France (70 percent), Belgium (65 percent), Spain (36 percent), Germany (34 percent), the United Kingdom (19 percent), and the Netherlands (5 percent).

Italy has shut down its nuclear power stations; Denmark, Greece, Ireland, Luxembourg and Portugal are continuing to dispense with the production of nuclear electricity, while taking the opportunity to import it from other Member States or from non-Community countries. The Netherlands and Belgium have decided to defer the continuation of their nuclear programmes. Furthermore, there are no longer any nuclear power stations under construction or on order in Germany. In Spain, the Moratorium on the Construction of nuclear power stations instituted before Chernobyl remains in force.

The United Kingdom, on the other hand, has decided to expand its nuclear power capacity. France will continue to invest in nuclear power as a function of demand.

Investment in nuclear power stations continues to be limited. This trend should continue until about 2010, when the current nuclear power stations will have to be renewed, according to the experts, who reckon on an average lifetime of 40 years for a nuclear power station built in accordance with the safety standards applied in Western Europe.

All these various aspects have served as a background for an analysis and update which the Commission of the European Communities has just completed. The update concerns an essentially technical document, the "Illustrative Nuclear Programme for the Community," the last version of which was published in 1984.

The update focuses on the outlook for the nuclear components and equipment industry in the context of 1992 and constitutes an adjunct to the Commission's ideas and proposals with regard to the completion of the internal market in energy.

The Commission's conclusion is clear: The large market must also apply to productive investment and to equipment and components in the nuclear power sector.

The Commission communication will be formally adopted once the Economic and Social Committee has expressed its opinion as provided for in the Euratom Treaty.

Common Standards

The Commission's message is basically the following: Common design and construction standards are required in the sector in order to decompartmentalize the national markets. This would enable economies of scale to be made to help increase the competitiveness of European equipment and component manufacturers, who are faced with competition from non-Community countries.

Economies of scale will also bring down the cost of nuclear energy as a result of equipment optimization. Above all, these economies will make it possible to step up efforts to increase the safety of such equipment, for which the Community would have the most stringent safety standards.

Against this background, the Commission is of the view that preparations for the future should be made in a concerted manner, in particular by supporting the work already begun by industrial groups in six Community countries (Belgium, France, FRG, UK, Italy, and the Netherlands), which by 1995 should result in the evaluation of the European Fast Reactor project.

The development of this new source of energy will be expensive, but the stakes in terms of industry and energy measure up to the scale of the project.

The European Fast Reactor will make it possible to utilize the entire energy yield of the uranium, instead of only about 1 percent, which is the case with the current generation of reactors.

Apart from the energy aspects, this power source will also make it possible to extend the period during which uranium resources can be used, thereby avoiding tension on the world market in this sensitive raw material.

Percentage of Nuclear Energy in EC's Total Energy Production (1980-1988)

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988
Belgium	23.3	25.4	30.5	45.7	50.8	60.3	67.2	66.0	65.5
FRG	11.9	14.6	17.4	17.8	23.6	31.1	29.5	31.3	34.0
Spain	4.7	8.6	7.7	9.1	19.3	22.2	29.3	31.2	36.1
France	23.5	37.7	38.7	48.3	58.7	64.9	69.8	69.8	69.9
Italy	1.2	1.5	3.8	3.2	3.8	3.8	3.8	-	-
Netherlands	6.4	5.6	6.4	5.9	5.8	6.1	6.1	5.2	5.2
UK	12.1	12.8	15.2	17.0	17.9	19.4	18.4	17.5	19.3
EC	11.7	16.0	17.8	21.2	26.4	30.7	32.3	32.4	33.9

Source: Eurostat

AUSTRIA

50 Kg of Uraniferous Material Seized

Two Men Arrested

AU1511191689 Vienna ORF Teletext in German 1728 GMT 15 Nov 89

[Excerpts] Bregenz—Approximately 50 kg of uraniferous material were seized in a hotel in Feldkirch [in the Province of Vorarlberg] yesterday evening. [passage omitted]

The market value is approximately 42 million schillings. The powder was packed in two airline travel bags. Apparently, it came from South Africa via Athens and Zurich and was taken by train to Austria. A 44-year-old Briton and a 58-year-old Austrian were arrested.

After receiving a tip-off from the FRG, the Feldkirch customs investigators traced the unusual luggage. Then the fire brigade, which had been called and equipped with radiation-proof suits, examined the bags.

According to Security Director Marent, the material is probably spent fuel from nuclear power plants. Later, the hotel rooms were examined for possible residual radiation, he stated. "No amounts of this were found," Marent stressed.

Material 'for Blackmail'

AU1611134089 Vienna ORF Teletext in German 1420 GMT 16 Nov 89

[Excerpt] Bregenz/Innsbruck—The material that was seized at a hotel in Feldkirch 15 November is uranium oxide. It can be used directly as a fuel element in nuclear power plants and for the production of atomic bombs.

This was announced by experts form the Test Office for Radiation Protection and Nuclear Technology at Innsbruck University after examination. The experts believe that the volume of 50 kg is not sufficient for use in a reactor. Thus, the uranium oxide seems to have been intended for blackmail or the production of atomic bombs. [passage omitted]

FEDERAL REPUBLIC OF GERMANY

Nuclear Equipment Sold to Iraq by FRG Company

AU1812134589 Hamburg DER SPIEGEL in German 18 Dec 89 pp 93-94

[Text] In the computer of the Federal Office for Criminal Investigations [BKA] the case is listed under Number BS+01/01 (99): "Accused: Hinze, Dietrich, born 25 March 1938, Balz/Brandenburg."

The BKA and the Federal Investigation Service (BND) have turned the case into a top secret matter. The customs investigators, who were called by authorities and investigated the Hinze case, were not given the background information. Only one sentence in the computer indicates the facts: "The accused is allegedly producing parts of facilities for gas ultracentrifuges for follow-up construction in Iraq."

Dietrich Hinze and his associate Peter Huetten own the machine factory H and H Metalform Ltd. in Drensteinfurt near Muenster. Over the past 2 years the company allegedly delivered machinery to Iraq which can be used for the production of gas ultracentrifuges. With such facilities it is possible to enrich uranium 235 by 90 percent. The result of the production is the material used for a nuclear bomb.

A new scandal is in the offing, perhaps one as serious as the delivery of the poison gas plant to Libya. According to the investigations so far, the Iraq deal is probably bigger than all illegal nuclear exports from Germany to date—even the illegal delivery of parts for Pakistan's nuclear armament.

Once again, the FRG government must expect serious accusations by the Allies, in particular, by the United States. The U.S. State Department has long suspected that highly dangerous German material for weapons has been delivered to Iraq, the worst enemy of the State of Israel.

In the meantime, the Bonn government has learned some things about the case, and these things are alarming. In addition to the H and H delivery, German

nuclear experts, who have had access to top-secret documents, have allegedly sold their knowledge to Iraq.

The BKA and the BND have found Walter Busse, 77, as one of the wire-pullers. In the past, Busse was department head of MAN Technology Ltd. in Munich. Over a period of many years and without the knowledge of his then-employer, he allegedly established a dense network of relations between nuclear-bomb builders in Iraq and Brazil on the one hand, and German contractors on the other.

During the investigations, the investigator noted that retiree Busse was in Iraq at least twice last year and this year. Busse is considered the man who established relations for H and H with the two Iraqi arms specialists Anees Wadi and Dr Safa al-Habbuby, who have been given special powers by the state.

Sometimes Busse was accompanied on his visits to the Tigris River by a good friend, Bruno Stemmler, 56, exporter for rotor technology at MAN Technology Ltd. Stemmler's escapades in Iraq were also unknown to his superiors.

According to the findings of the investigators, Busse urgently needed the MAN expert for special work at the Iraqi construction site of Tuwaytha [spelling as published]. This is the center of Iraqi nuclear research; Western know-how is in high demand. Busse and Stemmler have quite a few things to offer.

MAN Technology Ltd is a specialist there for centrifuge technology. In 1979 the Munich company built an assembly plant for centrifuges in the area of the uranium enrichment plant in Gronau, Westphalia.

Busse and Stemmler allegedly supervised the production of the H and H facilities in Tuwaytha. Centrifuges were produced there with H and H flow-turn machinery (construction serial DV 450-40-2100).

Even though the delivery of this nuclear technology is spectacular, illegal arms exports to Iraq are far from unusual. Dozens of FRG companies have already delivered technology and know-how for the Saad 16 armament project near Mosul in the north of the country.

There, Iraq's President Saddam Husayn promotes the development of new arms technologies; there, he has chemical combat agents produced and missiles of various ranges built. However, the special ambition of the militant statesman has for many years been directed toward nuclear bomb development.

Since 1981 at the latest, Husayn has been considered the man building nuclear bombs. At that time the Israeli Air Force destroyed the Iraqi reactor complex of Osirak near Baghdad.

At that time, the Israelis considered the first air attack directed at a reactor necessary to prevent the obviously imminent production of nuclear bombs. In Tel Aviv there was, and still is, concern that the Iraqis might equip Palestinian terrorist leaders with the bomb.

According to information gained by Western intelligence services, Husayn seems to be very close to the bomb. The Iraqis have aimed for this goal with much perseverance and skill. And they did not shy away from any expenditures.

Nuclear purchasers from Baghdad established contacts everywhere nuclear technology or know-how could be bought legally or illegally. Among other things, their route took them to Brazil, to the Avibras armament company there. There they got to know a German expert—Busse.

The former MAN manager was able to contribute good relations with German companies, in particular with H and H in Drensteinfurt. The two owners, Hinze and Huetten, for their part had good business with Avibras.

H and H has delivered quite a few instruments for precision arms technology to Brazil—preforms for the cases of missile engines and engine parts.

The orders from Baghdad put snap into the company. During the last years of the war against Iran, Iraq bought missile casings mainly from H and H. The demand was high; in only one night at the end of 1987 the Iraqi army fired 6,000 missiles at the enemy.

This barrage amounted to 3 months' production at H and H. At DM4,000 per unit it is not astonishing that the turnover skyrocketed. Within only 5 years Metalform increased its turnover by more than 10 times, to about DM42 million.

The Iranians, too, would have liked to buy cartridges (cases for missiles) in the Muensterland region. But H and H did not show any interest in doing business with Iraq's enemy.

Perhaps the renunciation was not quite voluntary. Perhaps the "worldwide experts for space travel or cooking pots" (their own advertisement) are no longer masters in their own house. Investigators of BKA and BND suspect that the Iraqis are secretly participating in the company.

The entrepreneurs from the Muensterland region deny this. However, the investigators have an H and H telefax to Iraqi negotiators in London. This telefax bears the phrase in Arabic handwriting: "A company which can be bought."

Perhaps events in the western Muensterland region might have been stopped 3 years ago—without any major damage. At that time, the customs investigation authority for the Muenster financial district found the first indications of improper business operations.

In 66 deliveries, H and H had exported 16,200 parts for missile engines to the Netherlands (value DM5.02 million) and an instrument for the production of missile engine cases (DM36,840) to Brazil. Neither export was approved.

The official reaction corresponded to the laxness concerning illegal exports, which also became evident in the

case of Imhausen/al-Rabitah. "Because of the revealed violations of laws" the Muenster Higher Financial Directorate imposed a fine of DM2,000.

The delivery to Sao Paulo of a flow-turn machine (price DM1.982 million), which is suitable for the production of centrifuges, was not challenged at all. The purchaser was the Navy Committee, responsible for Brazilian uranium enrichment.

Decison on Export Controls Postponed

51003038 Hamburg DER SPIEGEL in German 20 Nov 89 p 143

[Article: "Catching Their Breath: Bonn Postpones the Decision on Stronger Controls on Nuclear and Poison Gas Deals."]

[Text] FRG Foreign Minister Hans-Dietrich Genscher had an important paper with him when he flew to Washington last summer: he presented the American government with the text of a new law with which Bonn intended to prevent illegal bomb and poison gas deals with other countries.

Drastically increased penalties were supposed to deter illegal arms dealers. In the future, the dirty deals which Germans made in foreign countries would also be subject to punishment. Even support activities and crimes of negligence were to be subject to punishment—the currently necessary but generally unsuccessful proof of intentional crime would no longer be required.

The Americans were satisfied. Chancellor Helmut Kohl appeared to fulfil his promise that Bonn would block prohibited nuclear sales, for example, to Pakistan or India, as well as the export of biological weapons of mass destruction and the sale of chemical poison factories to exotic countries such as Libya or Iraq.

After the government had embarrassed itself at the end of 1988 with the attempt to cover up or play down the sensational scandal of the construction of a poison gas factory in Rabita in Libya, Kohl promised active penance to his incensed friends across the Atlantic. Kohl also acted at home, in the cabinet, ordering that the export controls in this dangerous area be strengthened, and that very quickly, at the very latest by the end of the year.

But it is not going to happen. Kohl promised too much. The bill drawn up by the FRG government has been blocked—for the time being—by resistance from within its own ranks. The legal expert of the [Christian Democratic] Union, Heinz Guenther Huesch, called his own government's bill "nonsensical and unconstitutional."

After violent arguments between ministries and within the parliamentary parties, a meeting of the coalition decided last week not to pursue that matter any further for the time being. It was agreed to wait for an additional legal evaluation by the Ministry of Justice. According to the foreign trade expert of the Union, Peter Kittelmann, all of the participants "have to catch their breath."

Although the Liberals held back, because of Genscher, the decision to postpone the bill was received with appreciation by the FDP [Free Democratic Party] parliamentary party.

In Bonn, only the opposition, Social Democrats and Greens, defended the government bill, which was intended to place stronger restrictions on weapon and poison exports. "Obviously the net is getting too tight for many in the governing parties," said a Liberal after frustrating debates in parliamentary committees.

The leader of the bill's opponents rejects the suggestion that they want to keep open a back door for shady export deals. According to Christian Democrat Huesch, he fully supports the "intentions" of the government: "No sympathy, no toleration for those who supply poison gas to Qadhafi." But unfortunately "the ethical intention [was] technically so poorly executed" that he, as a lawyer, could not approve it.

According to Huesch, the law would have made people such as the rocket researcher, Werner von Braun, and the physicist, Albert Einstein, subject to prosecution, if they were still alive, because their work has also been used for weapons. German scientists who gave presentations to international symposiums and German engineers working for, for example, American companies producing nuclear plants for export would also be threatened with prosecution.

Above all, however, the critics of the bill fear a "considerable competitive disadvantage" for German business. They prophesy "the ending of cooperation on European research and development projects in wide areas."

There may to some extent be something to this. But that is precisely the purpose of the law. The activities of German companies, engineers and scientists, which were too little controlled in the past, are supposed to be more greatly restricted in the future, if they are working with nuclear, chemical or biological material which is applicable to weapons production.

The Liberal opponents of the bill demonstrated in their parliamentary caucus last Tuesday [14 November] that they were not simply interested in clear legal concepts but rather in business for German companies. If Bonn is to comply with the wish of the Americans for German self-limitations on exports, then Washington must finally reduce the COCOM list, which limits the sale of sensitive products to the East Bloc.

The Liberals could hardly have given a more clear proof of whose interests they are representing than this counterdemand. If nuclear and poison-gas deals with Pakistan and Libya are to be limited, then industry should have the opportunity to make up for its losses through increased sales to the East Bloc.

German-Brazilian Nuclear Cooperation Treaty To Be Extended

AU1711133 Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 17 Nov 89 p 8

[Article by K.B.: "Nuclear Treaty With Brazil Will Be Extended]

[Text] Bonn, 16 Nov—The 1975 German-Brazilian treaty on cooperation in the peaceful use of nuclear energy will be extended bu the FRG government. An early cancellation of the treaty, concluded for a period of 15 years, would have been possible until 18 November. On Thursday [16 November] the Social Democratic Party of Germany [SPD] and the Greens once again urged the Government to use the remaining time to cancel the treaty. SPD Deputies Ganseforth and Bachmaier and Deputy Stratmann on behalf of the Greens again justified this demand by saying that the know-how provided by the Germans within the framework of this cooperation could be abused for the production of nuclear weapons. The opposition claims that there are indications that this is being done already. This is denied by the FRG Government. State Minister in the Foreign Ministry Adam-Schwaetzer stated during a session of the Budestag that after thorough examinations by the FRG Government and after negotiations with the Brazilian government there is no evidence of abuse. Therefore, there is no reason to stop cooperation, stated Mrs Schwaetzer, supported by CDU [Christian Democratic Union] Deputy Jaeger and FDP [Free Democratic Party] Deputy Timm.

'A Serious Mistake'

Chancellor Schmidt signed the treaty in spite of opposition by President Carter. In difficult negotiations, Carter had repeatedly warned Bonn against entering into cooperation in nuclear energy with Brazil, a country which has not signed the Nuclear Non-Proliferation Treaty. Bachmaier now criticizes this treaty of the SPD-FDP government as a serious mistake, which could however be partially mitigated by withdrawal from the treaty. The expectations which were attached to the treaty have not been fulfilled. For the sake of potential good business deals, an uncontrolled use of technology and technological knowledge from the FRG had been accepted. Since there is now an independent program in addition to the German-Brailian agreement, and since both have now even been combined, abuse is probable.

Cooperation Limited

In the meantime, German-Brazilian cooperation has been limited for financial reasons. Of 8 planned light-water reactors only 1 German reactor is currently under construction. In response to complaints by the opposition, that Brazil has not been fulfilling its reporting and monitoring obligations, Siemens-Kraftwerk Union, a parter in the agreement along with the government, replies that German-Brazilian nuclear cooperation is still subject to the safeguard regulations of the International Atomic Energy Agency. Mrs Adam-Schwaetzer states that it has been determined in discussions with the Brazilian government that the separation between the bilaterai and the independent programs will be maintained and that international safeguard prodedures will be observed. Disagreements about the extent and forms of reporting obligations have been settled. A joint German-Brazilian project for jet-nozzle enrichment is under the additonal control of the International Atomic Energy Agency. In addition, the new Brazilian constitution specifies that nuclear energy will be used exclusively for peaceful purposes. The work in Brazil on an nuclear-powered submarine, which has become known, is not, according to the FRG government, subject to the Nuclear Non-Proliferation Treaty.

Research Association Report on Nuclear Magnetic Resonance Published

90MI0002Z Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German No 510, 30 Aug 89 pp 7-8

[Excerpt] In international terms, there is a considerable shortfall in the number of top performance NMR [Nuclear Magnetic Resonance] spectrometers in the FRG. This emerged from an inventory analysis at FRG universities and research institutes, carried out by the German Research Association (DFG) equipment committee.

In recent years, nuclear magnetic resonance spectroscopy has developed into one of the primary methods of analyzing structures in chemistry, and has also found its way into medical diagnostics. It determines the precise atomic structure of molecules and their three-dimensional form; this is of crucial significance for the properties of the material in question, whether plastics, semiconductors for electronics, or pharmaceutical reagents.

Although more than DM90 million have been spent to purchase 158 NMR spectrometers in the last 10 years, both under the major equipment program set up to implement the law financing university building and under DFG funding procedures, there are at present only 11 units in the top performance class in the FRG. The DFG study demonstrates that at least 20 more of these high performance spectrometers, each costing nearly DM3 million, will have to be installed in the next 2 years if international standards are to be met. As the report explains, there is also a lack of both positions for NMR specialists and young scientists qualified in this field.

The report presents the situation separately for both fluid and solid-state spectrometers. An overview of the fields in which each type of unit is used completes the study. [passage omitted]

SPAIN

Fire at Valdellos I Termed 'Catastrophic'

Hydrogen Leak

90WP0010A Madrid DIARIO 16 in Spanish
21 Oct 89 p 16

[Report by DIARIO 16 correspondent Elias Pujol; first paragraph is DIARIO 16 introduction]

[Text] The studies conducted by specialists from the Nuclear Safety Council indicate that there are no traces of radioactivity in Tarragona as a result of the accident on Thursday at the Vandellos I power plant. The cause of the explosion and resulting fire that alarmed local residents was, according to the initial assessment, a hydrogen coolant leak. The leak was due to a mechanical failure in a turbine. It took 24 hours for the reactor's cooling system to return to normal. Civil Defense is looking into who might be to blame.

Tarragona—A preliminary assessment of the incident that took place early yesterday morning at the Vandellos nuclear power plant in Tarragona has led experts to conclude that the explosion that alarmed local residents was due to a leak of hydrogen coolant, which upon coming into contact with the oxygen in the air triggered the blast and subsequent fire.

The hypothesis that the experts proposed is that a mechanical defect in the turbine caused it to slow rapidly and shake violently along the shaft that runs between it and the alternator of the turbogenerator, with the resulting loss of airtightness and the release of hydrogen coolant.

The civil governor of Tarragona, Ramon Sanchez; the general manager of HIFRENSA, Fernando Rosell, and the manager of the power plant, Jesus Gil Uguet, explained yesterday at a press conference that the reactor core "continues to be cooled with pumped water 24 hours a day." Five inspectors from the Nuclear Safety Council in Madrid traveled to the plant expressly to assess the damage.

They indicated that "traces of radioactivity have not been found in the water that flooded the area."

Whereas the Civil Governorship asserts that power plant officials did not report the accident for a half-hour, the management says that the incident was reported immediately.

Maximum Penalty

The spectacular fire started at 2115 hours on Thursday night and was not controlled until after 0400 hours yesterday. Fire departments from all over the province of Tarragona and from Martorell Park in Barcelona were mobilized to fight it.

The director general of Civil Defense, Pilar Bravo, has called for the maximum penalty for the nuclear power plant, while the Civil Governorship of Tarragona asserted that if there is shown to have been negligence, it would demand whatever penalties are necessary.

An extensive joint report, which stated that as far as the power plant was concerned the incident began at 2129 hours, was presented during the news conference at the Civilian Government. This time does not square with the information that the Civilian Government of Tarragona furnished, according to which Civil Defense received an anonymous phone call at 2144 hours informing it that "a lot of smoke was coming out of Vandellos I."

For its part, the Civilian Government maintains that the fire started at 2115. Documentary evidence and witnesses will determine the exact time of the accident.

Ramon Sanchez stated that in the opinion of the CECOP [Operative Coordination Center], there was a delay in reporting to the Civilian Government, and he underscored that "there is no explanation as to why the firemen should be aware of the incident, and the director of the Nuclear Emergency Plan, who is the person who has to set the entire operation in motion, should not."

He also indicated that internal coordination with the CECOP and with the emergency room at the Nuclear Safety Council was good.

The aforementioned report emphasizes that once what had happened became known, the posts at Cambrils, Hospitalet, and Vandellos and the Traffic Group mobilized immediately and sent a total of 25 men and 10 vehicles to the power plant. Their function was to patrol around the plant and maintain security.

The citizenry was opportunely notified, and security force members were on alert in case checkpoints had to be set up or traffic diverted. In addition, during the entire time that the Nuclear Emergency Plan remained in force, all of the other Civil Guard posts in the area were on reserve status [estado de reten].

The governor emphasized that at the request of the power plant, self-contained bilge pumps were obtained and that companies at the petrochemical park in Tarragona worked together to put out the fire.

The Vandellos I nuclear power plant will remain down indefinitely, inasmuch as it suffered considerable damage, which will take many days to repair.

Plant Shutdown

Sources close to the workers at the power plant have noted that they may call for the permanent closure of the plant, inasmuch as its operating license expires in 2003. To this we must add that the output capacity of Vandellos I, the first atomic power plant built in Spain, is very small, a little over 400 megawatt-hours.

According to the Nuclear Safety Council, the oral reports received at SALEM [Emergency Room of the Nuclear Safety Council] during the incident indicate that two turbofans and two circuits of the heat exchanger, run by two auxiliary pumps, have been available to cool the reactor.

At times both pumps were shut down because of problems in regulating the level of their feeder tanks. They also indicated that the cooling of the reactor core, which is what most concerned technicians, was assured at all times.

According to the same sources, the power plant is being brought to a safe shutdown with these systems. As a result of the efforts to put out the fire, the lower levels of the reactor hall have been flooded.

This has made several of the power plant's systems inoperative, in particular the shutdown exchanger pumps [bombas del cambiador de parada].

First Nuclear Power Plant

The Vandellos I nuclear power plant, the first of its kind in the country, began operating in 1972.

Vandellos I can put out 480 megawatt-hours and uses French technology; in this latter respect it is unique, inasmuch as all of the others in the country employ American technology. It is operated by Hifrensa.

There was a similar accident at Vandellos I in November 1986, when a fire broke out in the turbine room and spread to the cooling oil.

Vandellos I is scheduled to shut down in 2003.

The mayors of the towns in the power plant area (Vandellos, Tivisa, Pratdip, Montroig, and Amella de Mar) met yesterday and complained about the scant information they had received about the fire.

The mayors mentioned that they might withdraw from the Nuclear Emergency Plan. They plan to request a meeting with the civilian governor and, depending on the outcome, may decide to withdraw from PENTA [Nuclear Emergency Plan of Tarragona]. "It is very possible that we will think about withdrawing from the Nuclear Emergency Plan and, at the same time, speak out against the provisional license that Vandellos II has," said Montroig mayor Josep Maria Aragones.

According to him, "the reason for leaving PENTA is that we have no system that can guarantee citizens that if something happens, the minimum can be done to assure their safety. We don't think of ourselves as whores, much less cheap whores, and once and for all we're asking for the infrastructure that is needed to keep the citizenry safe."

The councilman in charge of civil defense for the Vandellos municipal government, Josep Maria Escoda, spoke out against the failure to carry out the plan to correct shortcomings that PENTA had prepared. "In 1987 the municipal government of Vandellos and Civil Defense signed a document that listed a total of 21 shortcomings, 16 of which have not been addressed. This accord was signed with dates and deadlines for implementation, and it has not been complied with."

The councilman also complained that the Vandellos radio broadcasting system has not been working for 5 months and that the public-address system in the streets of Hospitalet del Infante was supposed to have been installed in 1987. "The fact, however, is that it was installed just 3 months ago and does not cover the entire urban area, which is less than 5 kilometers from the two nuclear power plants at Vandellos. This creates doubts about a plan to evacuate the population in the event of a nuclear accident."

Negligence Charged

90WP0010B Madrid DIARIO 16 in Spanish 22 Oct 89 p 13

[Report by Elias Pujol]

[Text] Tarragona—As the hours pass and more information comes out about the incident last Thursday evening at the Vandellos I nuclear power plant, suspicion mounts that it was the most serious nuclear accident in Spain in the past 17 years, since Vandellos I, Spain's first atomic plant, went on line.

Various sources have mentioned that the situation inside the power plant was "terrifying" after the explosion, which was very violent, and the subsequent fire. These same sources indicated that never before had they been so frightened inside the plant and that the population does not have the slightest idea of how serious the incident could have been.

The technicians who helped to put out the fire realized that the situation was worrisome because there were serious problems cooling the reactor core. If the loss of cooling had not been stopped, an extremely dangerous situation could have arisen, similar to the one that developed in the Soviet plant at Chernobyl.

Several specific developments underscore that this was a serious accident. First, the director of Civil Defense, Pilar Bravo, said that the fire entailed an "obvious risk." Second, the civil governor forbade the management of the power plant to make statements to the mass media until after a meeting had been held with technical personnel from the Nuclear Safety Council and the Industry Ministry. Third, the mayors of the towns around the power plant were not allowed to attend the meeting at the plant with the manager and with various nuclear experts. And fourth, the Nuclear Safety Council immediately sent five of its top investigators to Tarragona.

The five investigators that the council sent include experts in nuclear systems, in instrumentation and control, and in fire-control systems, as well as the chief of projects. The General Directorate of the Industry Ministry sent another director, Rafael Sanmartin.

In the coming days this team of skilled technicians will draft a report that will later be analyzed and discussed by the top officials of the Nuclear Safety Council, the Industry Ministry, and Civil Defense.

The report will also lay the groundwork for ascertaining the real causes of the accident and for deciding whether the management at Vandellos I ought to be penalized.

Lastly, it bears noting that yesterday the power plant continued the procedure leading to a safe shutdown, which should happen in the next few hours. A safe shutdown guarantees the security of the reactor, which is laden with nuclear fuel.

The hope is that over the next few hours the plant can air-cool the reactor, as the shutdown systems are supposed to do.

The governor of Tarragona has criticized the way the power plant has been run, describing it as negligent.

Dismantling of Power Plant

The World Information Service on Energy (WISE) released a communique early yesterday afternoon calling for the dismantling of the Vandellos I nuclear power plant. "We are requesting the permanent shutdown of the power plant, that it not be repaired, and that it not be reconnected to the electric-power grid, inasmuch as this is the most dangerous of the nuclear plants that exist in Spain."

Jaume Morron, the WISE delegate in Spain, asserted at a news conference that this type of power plant, which uses French technology, has become obsolete and that all of the existing ones in Europe are being shut down. "The four in France will be closed from 1990 to 1994, it has been announced, and the only one in Italy was closed in 1986." As we will recall, the operating license for Vandellos I expires in 2003, though it could be extended for another 10 years.

The top WISE representative in Spain also described the fire as "a very serious accident."

Safety Measures Required

90WP0010C Madrid YA in Spanish 24 Oct 89 p 17

[Excerpt] [passage omitted]

Second Hand

Several environmental organizations and the mayors of three towns near Vandellos I have already asked the Ministry of Industry and Energy to revoke the operating permit for this nuclear power plant.

The turbine damaged by the fire will be replaced with one from a French atomic power plant that is currently being dismantled, Carlos Fernandez Palomero, the manager of the power plant, has reported.

The management of Hifrensa, the Spanish-French firm that runs the plant, is looking into producing electric power again in 4 to 6 months, a company spokesman has reported. Production could reach 50 percent of the nuclear plant's capacity, inasmuch as only one of the two turbogenerators would be operating. If the program to restart the plant is carried out, though, it will be at full capacity in a year.

In order for Vandellos to operate again, it will have to implement the five accident safety measures that the Nuclear Safety Council stipulated for the plant after the Chernobyl accident. Only two of the five measures have been implemented so far, the company acknowledged.

Shutdowns Sought

90WP0010D Madrid DIARIO 16 in Spanish 25 Oct 89 p 16

[Report by Elias Pujol; first paragraph is DIARIO 16 introduction]

[Text] The mayors in the Vandellos nuclear belt have asked the central government to immediately shut down the two local atomic power plants, Vandellos I and II, until their safety demands are met. The mayors, who discussed the possibility of withdrawing from the Nuclear Emergency Plan of Tarragona (PENTA), have previously called for a program to insure that the population will be evacuated in the event of an accident.

Tarragona—The mayors in the Vandellos nuclear belt are asking the central government to immediately shut down the Vandellos I and II power plants until it meets the demands that they voiced in 1987.

Great interest had been aroused by the meeting that the five mayors in the nuclear area (Montroig, Tivisa, Pratdip, Amella de Mar, and Vandellos-Hospitalet) were to hold with civil governor Ramon Sanchez at the seat of the civil governorship in Tarragona so that he could inform them of everything that had happened in connection with the fire that broke out in the power plant's turbine room.

All of the mayors were on edge before the meeting, which began at noon and lasted until after 1530 hours.

At the last minute the mayor of Vandellos dissociated himself from his colleagues' initial proposal to quit PENTA.

Whereas all of the mayors agreed that PENTA has once again shown itself to be inoperative, the mayor of Vandellos, Carles Barcelo, expressed opposition to leaving PENTA because it would mean leaving the citizenry unprotected.

Agreements Broken

For his part, the mayor of Montroig, Jose Maria Aragones, announced that at the full session of his city council next Thursday he was planning to propose that the municipality withdraw from the Nuclear Emergency

Plan, inasmuch as he felt that the government has failed to comply with all of the accords that had been signed right at the seat of the civil governorship in the presence of prominent members of the central government.

"At the last assembly of the Catalan Federation of Municipalities we denounced the failure to comply with the commitments made and agreements signed at the Tarragona Civil Governorship in October 1987," asserted the mayor of Montroig, adding that his request to quit PENTA was based on the failure to carry out the plan to correct existing shortcomings, which mean that the evacuation of the population in the event of a nuclear accident could not be guaranteed.

"When the entire plan has been carried out, then we will sit down and talk again about the Nuclear Emergency Plan. For the time being, though, my proposal is to withdraw from PENTA," noted Jose Maria Aragones.

After the meeting at the civil governorship the mayors of Tivisa, Montroig, Amella de Mar, and Pratdip agreed to call for the shutdown of the two nuclear power plants (Vandellos I has already been shut down after the accident last Thursday) until all of the infrastructure to alert and evacuate the population in the event of an emergency is in place.

For its part, the Vandellos municipal government took legal measures and sued the central government for failure to comply with the accords that had been reached, as 17 of the 21 items in the program to correct shortcomings have yet to be taken care of in this municipality.

Irresponsibility

The moves that the various mayors have proposed will be approved this week by the full sessions of their respective municipal councils, and the resolutions will be submitted to the civil governor, who has promised to convey them to the government.

Moreover, Civil Governor Ramon Sanchez has indicated that it would be irresponsible of the mayors to withdraw from the Nuclear Emergency Plan because they would not be discharging their duty as mayors of towns in the nuclear power plant area.

The Nuclear Safety Council (CSN) itself has given assurances that "Vandellos will not be given the go-ahead until it is as good as new." The director of the information division of the CSN, Antonio Machin, told DIARIO 16 that "the requirements that have to be met at the power plant so that the CSN will give its approval do not amount just to a cleanup of the damaged area and the replacement of the burnt cables. Rather, in order for the CSN to issue a favorable report, which is mandatory for startup, it will have to be made as good as new."

Separately, the manager of the power plant, Carlos Fernandez Palomero, told DIARIO 16 that he has no plans to shut down Vandellos I. In fact, he has stated that the power plant could be operating again in a few months, about 4, although at 50 percent capacity, since total repair of the damage could take "up to a year."

Firemen Do Not Want To Return

The Fire Department of the Generalitat [executive body of the autonomous community of Catalonia] does not want to fight fires inside a nuclear power plant again until it receives proper training and equipment.

According to the firemen, they were in great danger because they had practically been tricked into battling the blaze at the Vandellos I atomic power plant. They were not told of the nature of the fire or where it had started. They also complained that they had to use water in an area with electrical conduits, which created a serious threat to their physical integrity.

The 53 firemen employed by the Catalan autonomous community who helped to put out the blaze in the turbine room underwent radiological examinations at the Vandellos II power plant from Monday afternoon until yesterday morning. The results were negative.

Nevertheless, the firemen are greatly concerned about what could have happened to them and are asking for another examination, this time at an independent center, to learn whether they have received any radioactive contamination.

The union sections of the UGT [General Union of Workers] and CCOO [Workers Commissions] denounced the situation in which the firemen had been placed, inasmuch as they were at no time advised of the danger that working at the plant entailed.

CCOO, through its secretary general in Tarragona, Jose Estrada, asserted yesterday at a press conference that the union would demand the permanent shutdown of Vandellos I. The labor leader asserted that after the incident at the nuclear power plant the officials at Vandellos and of the Nuclear Safety Council ought to be in prison because they are criminals. "What happened is serious enough for them to spend the rest of their lives in jail," he said. CCOO also said that it doubted the autonomy and independence of the Nuclear Safety Council.

10 Billion in Losses

90WP0010E Madrid DIARIO 16 in Spanish 26 Oct 89 p 14

[Report by Elias Pujol]

[Text] Tarragona—The losses caused by the fire on Thursday the 19th that destroyed the turbine of the number two turbogenerator at the Vandellos I nuclear power plant could total some 10 billion pesetas, according to what DIARIO 16 has been told by various sources linked to the Hifrensa shop committee.

The same sources have noted that to these losses must be added the 50 million a day that Hifrensa (Hispano-Francesa de Energia Nuclear, S.A.), the owner of the

plant, is not earning from the production of electric power (400 megawatt-hours when the plant is operating at full capacity).

It should be noted, however, that the damage caused by the fire will be covered by Pool and domestic and foreign insurance firms, which in recent days have sent their top investigators to Vandellos to estimate the losses.

Catastrophe

There has been a great deal of commotion at the Vandellos I nuclear power plant in recent days. On the one hand, the Nuclear Safety Council has sent six inspectors there, and they are expected to have their report finished this week. On the other, insurance companies have sent in their experts, and the companies that assembled the nuclear power plant have assigned their own skilled personnel there.

One of the latter companies is Alstholm, the French firm that designed the turbine. After photographing the condition of the turbine, it concluded that "this was catastrophic." As we will recall, the fire started in the alternator, which was designed by Jeaumont-Shneter, and spread to the turbine; both pieces of equipment were destroyed.

Shutdown Demanded

The Hifrensa shop committee held a press conference yesterday at which it released a communique stating that the incident at Vandellos I "is conventional and, therefore, not nuclear." It added that at no time did the accident pose the slightest danger to personnel, local residents, or the environment.

The members of the Hifrensa shop committee called for urgent changes in PENTA standards.

A total of 26 union, political, and civic organizations from Tarragona have met at CCOO offices to take a common stand on the Vandellos issue and to demand that the power plant be shut down. The UGT was one of the signatories of the communique that was made public yesterday.

Besides calling for accurate information about what happened at the Vandellos I nuclear power plant, these groups are holding Hifrensa, the Nuclear Safety Council, and Civil Defense accountable "because they are obviously to blame for the incident."

Second Incident Reported

90WP0010F Madrid DIARIO 16 in Spanish
27 Oct 89 p 5

[Report by Elias Pujol; first paragraph is DIARIO 16 introduction]

[Text] Damage to a transformer circuit breaker yesterday caused another incident at the Vandellos I nuclear power plant in Tarragona 8 days after a turbine caught fire there. In spite of attempts by Civil Governor Ramon Sanchez to calm local residents by downplaying the incident, the thick cloud of smoke caused alarm. Environmental groups called for the shutdown of the power plant, which the government is giving serious consideration.

Tarragona—Another incident at the Vandellos I nuclear power plant in Tarragona caused alarm among the population yesterday, when the circuit breaker in the auxiliary transformer of turbogenerator set two incurred damage and produced a thick cloud of smoke.

In light of the panic that has been created, the civil governor of Tarragona, Ramon Sanchez, stressed that this new accident did not pose any danger, indicating that the Nuclear Emergency Plan did not have to be set in motion and that the incident occurred while the reactor was in a safe shutdown. In spite of the civil governorship's attempts to reassure the population, residents of Amella de Mar, a town a little over 5 kilometers from the power plant, wanted to leave their homes.

Shutdown Under Study

The government is seriously considering the closure of Vandellos I because its technology is obsolete. The Executive Branch is awaiting the report from the Nuclear Energy Board before making a final decision.

Yesterday evening at full sessions the municipal governments of Tivisa, Pratdip, Amella del Mar, and Montroig approved a request that the Vandellos I and II nuclear power plants be shut down until the 3-billion peseta plan to correct inadequacies is carried out; the plan calls for infrastructure projects to insure that the population is evacuated in the event of accidents at the plant.

The environmental organizations WISE and Greenpeace reaffirmed the need for a rapid dismantling of the Vandellos I plant and underscored that the management of Vandellos I and the Nuclear Safety Council itself are to blame for last week's accident, because in January 1984 a similar accident, with an explosion that wounded two, took place at Ascot I.

In the view of Ramon Sanchez, this new accident is regrettable "regardless of how small, because of the tension that exists. I would appeal to the population to gradually regain their calm. Such tension cannot last for so many days, because it could have grave consequences."

The aforementioned environmental groups have also stated that the Vandellos I plant would not pass an inspection by the International Atomic Energy Agency in the area of fire-fighting services.

The WISE spokesman described as "fanatical, foolish, and lacking in solidarity with society" the Vandellos I executives and the Impresa shop committee, which has come out in favor of the renewed operation of the plant.

The environmentalists are also complaining that the Generalitat did not make public the measurements of the release of radioactivity from the incident last Thursday.

Alternatives

WISE and Greenpeace also announced that they are drafting a study on ways of offsetting the closure of Vandellos I so as to show that it would not have an adverse impact on Spain's electric-power output.

Outrage over the incident has mounted as a result of a statement by the chief of the Amposta fire department, Jose Pino, who reported that on the day of the fire at Vandellos I the technicians ran out of the installations at the nuclear power plant because they were afraid that they were in danger and that people were heard shouting that the reactor could explode.

Moreover, some 500 locals have signed a manifesto calling for the shutdown of the two Vandellos nuclear power plants. A demonstration will be staged in Amella del Mar in early November, inasmuch as the civil governor of Tarragona has banned the protest rally scheduled for Sunday because an election is taking place.

Civil Governorship Downplays Incident

The civil governor of Tarragona, Ramon Sanchez, said yesterday that the new incident at Vandellos I should have been reported to the authorities more promptly in light of the "especially jittery mood of the population."

Sanchez contacted the mayors of the five towns in the nuclear belt to inform them of the incident at Vandellos I. Afterwards he made an appeal over the mass media for the population to remain calm.

The governor asked the people to bear in mind that "panic situations can cause more problems than rigorous observance of the instructions that we would give you if anything had happened."

He also cautioned that if people left their homes, "they might even cause serious traffic jams, accidents, or other such problems."

For his part, the president of the Generalitat, Jordi Pujol, stated yesterday that he has asked the Nuclear Safety Council to demand maximum security measures at the power plant.

In the wake of this incident, the Federation of Municipalities of Catalonia (FMC) has called for an urgent meeting of the Catalan Civil Safety and Defense Commission to take up the two incidents that have occurred in less than one week at the same power plant.

The statements of environmental groups focused on their calls for a permanent shutdown. Representatives of Greenpeace invited the mayors of Reus and Tarragona to throw in with the antinuclear struggle, indicating that they should make sure to draft a reliable evacuation plan for their citizens.

[Box, p 5]

Towns Near Garona Call for Shutdown

[Article by Arturo Cenzano]

Madrid—Mayors and representatives of 28 towns near the Santa Maria de Garona nuclear power plant have called for its shutdown until emergency plans are formulated, with full guarantees, and until the central government provides mandatory compensation to local city halls.

The movements that are opposed to the power plant, which have formed the so-called "Anti-Garona Coordinating Board," maintain that the plant has dumped radioactive waste into the Ebro. They also say that the installations have had to undergo several changes during their shutdown for reloading and that there have been at least two uncontrolled spills of radioactive liquids.

Nevertheless, executives at Nuclenor, the company that owns the power plant, underscore that the discharges into the Ebro over the past 12 months involve a level of contamination that is 1/100th of the limit set by the Nuclear Safety Council.

As for the 442 days of unscheduled downtime that the reports drafted by the environmental groups mention, Garona technicians say that over the past 3 years the power plant has been down for only 199 days.

For their part, the mayors of the towns near Garona are trying to have added to the 1.05 billion pesetas that the central government has promised, cash compensation from the other businesses of the owners of the plant (the Iberduero and Electra de Viesgo companies) and from the profits that they make from running it.

'Worst' Accident

90WP0010G Madrid YA in Spanish 27 Oct 89 p 21

[Text] Tarragona—The Nuclear Safety Council yesterday made public a news release in which it describes the accident last Thursday the 19th at Vandellos I as "the worst incident at a Spanish nuclear power plant." Separately, a short circuit in one of the transformer connections was the cause of another accident yesterday morning at the same power plant.

Yesterday afternoon the Nuclear Safety Council made public a communique in which it described the accident last Thursday the 19th at Vandellos I as "the worst incident at a Spanish nuclear power plant."

The council indicated that the fire started at 2139 hours in the power plant's second turbogenerator set. "The studies conducted so far have identified as the most likely cause the breakage of a turbine-shaft retainer bearing [cojinete de sujecion] due to vibrations of the turbine. The breakage of the bearing led to the loss of lubricating oil and to cracks in the electric generator that is connected to the turbine. The cracks in the electric generator caused the release of the hydrogen that cools it. When the hydrogen came into contact with the oxygen in

the air, it burst into flames, which caused the oil that had spilled to burn." The two sets of turbogenerators and the nuclear reactor immediately shut down. The fire spread through the power-generating room, located below the turbines, and damaged various systems at the plant.

The council says that "no release of radioactivity that would have posed the slightest danger to emergency personnel or to the public was detected during the incident."

There was another fire yesterday at Vandellos I. The assistant manager of the nuclear power plant, Enric Pla, said that it was due to human error.

The incident was caused by a short circuit in an auxiliary transformer that receives electric current from the outside, which is needed for repair work at the power plant after the fire on the 19th. The fire started at 0908 hours yesterday and was reported to Tarragona Civil Defense at 0935 hours, almost a half-hour later, after it caused alarm in the towns near the complex because of the large cloud of smoke it created. Personnel at the power plant were able to take care of the problem without calling in the Generalitat's firemen.

The civil governor of Tarragona, Ramon Sanchez, appealed for calm among the population and indicated that "the incident by itself did not require immediate reporting, but the especially jittery mood of the population dictated greater speed." The governor confirmed that residents of Amella del Mar, a town located some 10 kilometers from the nuclear power plant, became so alarmed when they saw the column of smoke that they got ready to evacuate.

Plant Shutdowns

The municipal government of the Burgos town of Quintana Martin Galindez yesterday passed a motion calling for the shutdown of the Santa Maria de Garona nuclear power plant because it feels that it poses a similar risk to the population as the Vandellos I plant does. The motion was passed with the support of the nine city councilmen who belong to two independent slates.

SWEDEN

End Looms for Nuclear Energy Despite Costs

90WP0013A Hamburg DIE ZEIT in German
20 Oct 89 p 36

[Article by Wolfgang Zank: "Sweden To Abandon Atomic Power; Industry and the Unions Are Still Fighting It, But the Withdrawal Can Hardly Be Stopped"]

[Text] The Swedes can credit themselves with two apparently contradictory world records. At the present time, no other country in the world produces as much atomic-generated electricity per capita as Sweden, yet at the same time, no other country that has atomic power plants is as thoroughly committed to turning away from atomic power as Sweden. By the year 2010, the last of Sweden's atomic power plants—currently 12 in number—will have been scrapped. The first two atomic plants are scheduled to go off-line in 1995 and 1996, and at the present time, there is a great deal of resistance to the plan.

The first step will be re-examined once again by Sweden's Parliament next year, and the controversy surrounding nuclear energy has once again heated up and taken a pre-eminent position in this re-examination process. Industrialists and trade union officials alike are calling for a slower pace in abandoning nuclear energy. Otherwise, they claim, entire branches of industry would go bankrupt, and entire areas of the country would be threatened with economic collapse. Nevertheless, a good two-thirds of all Swedes, and practically all the politicians, are holding on to the present timetable firmly.

"As recently as the early seventies we still intended to build a total of 24 reactors. In 1967, I participated in demonstrations against the construction of hydroelectric power plants in Norrland," said Leif Gustavsson, spokesperson for the Social Democratic Workers' Party. "At the time, we thought it was crazy to flood the beautiful river valleys when we would soon have so much cheap atomic power." The Social Democrats, of all people, placed so much hope in atomic power. In the 1976 election campaign, they were the only party to come out in favor of more nuclear energy without any reservations; the others were either against it, or they remained silent for tactical reasons. "That position caused us to lose the election," Gustavsson said. Two years later, the moderate Faelldin government collapsed over the nuclear power issue.

The decisive impulse for moving away from nuclear power came in 1979 with the reactor accident in Harrisburg (Pennsylvania) in the United States. "We recognized that we had to change our position," Gustavsson recalls. "Evidently, it was impossible to rely so completely on the experts." In March 1980, the Swedes were able to decide on the future of atomic power in a plebiscite. At that point, all the parties were in favor of its removal; there was just a number of variants as to how to go about it. In terms of constitutional law, the referendum had nothing more than an "advisory" function, but all the politicians stated that they would be guided by the outcome of the plebiscite. At that time, six reactors were operational, four were finished, but not yet on-line, and two more were under construction.

According to the suggestion of the most vehement opponents of nuclear power, the unfinished reactors should not be put on-line, and those plants that were already functioning should be closed within 10 years. This proposal came very close to winning a relative majority, but victory went to the plan that was propagated by the Social Democrats and the Liberals. According to this plan, all plants that were under construction were,

indeed, to be finished, but no new nuclear power plants were to be built. Due to the fact that power plants have only a limited lifespan, it was clear that nuclear energy would slowly but surely disappear from Sweden. Only the date of the final shutdown remained uncertain.

In the same year, the Upper House decided unanimously to shut down all reactors by the year 2010. Then, in 1988, the Swedes decided to take withdrawal from nuclear power seriously by the mid-nineties, and to close the first two plants, with further consultations on the matter to be taken up by 1990. The Upper House and the Parliament went even farther, however, and decided, in addition, that no new hydroelectric power plants should be built. It was also decided that the levels of carbon dioxide emissions, which occur in conjunction with all combustion, and which are responsible for the "greenhouse effect" in the atmosphere, must remain constant. Thus, new coal- and gas-fired power plants can be installed only if the carbon dioxide emissions are reduced in some other quarter, such as in automobile traffic.

Due to these stringent regulations, the question regarding what sources of energy should replace nuclear power became an acute one. Stig Malm, the Chairman of LO, the confederation of labor unions, has already publicly demanded the construction of new hydroelectric power plants. Leading Social Democrats have also been thinking along these lines, but a political majority in support of this position is as yet nowhere in sight. "The decision to move away from nuclear energy was taken without any indication as to what should replace it," says Lars Gunnar Larsson of the Swedish Association of Industry. "Now that it is slowly becoming a concrete reality, the people are suddenly realizing that the whole business could be quite expensive."

Just how much turning away from nuclear energy will cost is something no one can say. Last year the State Power Authority presented a detailed estimate in which the costs of shutting down the two reactors by the mid-nineties are estimated. The estimate took higher power generation costs in other facilities into account, as well as the cost of new filters, because air pollution must not be allowed to increase, either. The costs associated with the re-training and re-location of personnel from both plants were also included in the calculations. If the consumption of electricity remains the same, for a period of 5 years the Swedes will have to pay an estimated DM150 million per annum for the dismantling of atomic energy facilities. That would come to DM17 per capita, or approximately DM70 per family. If, on the other hand, power consumption increases, and new power plants have to be built, the costs also increase rapidly. In the case of an increase in consumption of 10 percent, a family would have to pay DM240 per annum.

The shutdown of the first two power plants will be relatively inexpensive, because the Swedes have considerable excess capacities at their disposal at the present time. The situation does not become tense until the beginning of the next millennium, when other plants are scheduled to close. Nearly half of Sweden's electricity is produced in atomic power plants today.

It will hardly be possible to back away from nuclear power without experiencing considerably higher costs for electricity. This thought alarms both industrialists and labor union leaders. "The Government just put an investigative committee into place whose task is to find out why Swedish firms are investing more and more abroad, and less and less at home," industry's spokesperson Larsson said. "The Government might do well to ask itself whether there is not a connection to its own policies." Among the power-intensive industries are steel and aluminum plants, some segments of the chemical industry, and above all, the paper industry in the country's North. There are 130,000 people working there. Many small towns are nearly totally dependent upon a single factory or mine. Unionists and industrialists alike fear that these factories and mines will have to close.

An exhaustive study of the Vattenfall State Power Administration puts these fears into perspective, however. The authors of the study consider an increase in electricity costs of circa 6 pfennigs per kilowatt hour probable. It would thus be erroneous to speak of the total eradication of the power-intensive segments of industry, but in some branches of industry, the effects are, indeed, sobering. If electricity prices were to remain constant, for example, the paper and pulp industry would increase by 50 percent by the year 2010, but if electricity prices were to increase, it would stagnate. If energy prices remained constant, the iron and steel industry could still increase by 20 percent. If energy prices increase, production will fall off by 50 percent. According to this study, industry's annual growth rate would decline by 0.4 percent, and 70,000 jobs, or approximately 2 percent of the present total, would disappear.

Yet, according to predictions, these jobs would be recreated in other firms. At present, the job market is virtually picked clean. Plant expansions or the founding of new branch plants are hampered in many cases, due to a shortage of workers. So there will be new jobs, even if only some of them will be in those areas where mines or steel mills close.

The hard core opponents of nuclear energy are little swayed by the arguments advanced by industry. "They have been paying extremely low electricity rates for years, they pay relatively low wages, yet they are always complaining," says Eia Liljegren Palmaer of the "Peoples' Campaign Against Atomic Energy". The opponents of nuclear energy estimate that the opportunities to save energy are very great. "If every household used just one energy-saving light bulb, we could do without an entire atomic power plant."

At present, Sweden's households consume far more energy than its industry. Many use electricity as their heat source. As a result of an expansion of its long-distance heating network, it would be possible to save

electricity in areas of high population density, but what should be done in the many smaller towns? "Build stoves for bio-fuel," says Eia Liljegren Palmaer. "It could be done for about 35,000 marks. That is much less expensive than heating with electricity." With better insulation, more efficient refrigerators, or more precise measurements of what actually is consumed, the Swedes could also save a lot of electricity, but in rented apartments thus far, Swedes have not been paying rent surcharges if they use a great deal of electricity. No wonder that electricity consumption per square meter in rented apartments is much higher than in privately owned homes.

Without a doubt, there are many opportunities to save. No one can say with any degree of accuracy how high electricity consumption will be in the year 2010. Vattenfall, the State energy company, has commissioned estimates on this account. The result: Even given an annual economic growth rate of 1.9 percent, one-third of the current level of energy used could be easily saved over the next 20 years.

Despite such opportunities for saving, the Swedes would still need new sources of energy, because in the final analysis, with the disappearance of nuclear energy, half of the previous electricity supply also disappears. It is here that the alternative of choice for the opponents of nuclear energy is called bio-fuel. Wood, for example, should no longer be planted solely to produce paper. It should also be planted for special power plants. The objection that every type of combustion increases the amount of carbon dioxide emissions, does not stand up in the view of the opponents of nuclear energy. "Bio-fuel fits into the natural cycles," explains Bengt Goeran Jansson, the spokesperson for the "Peoples' Campaign Against Atomic Energy." "In the growth of plants, just as much carbon dioxide is absorbed as is released as a result of the combustion."

In point of fact, many experts are coming to rely on the combination of saving and bio-fuel. Lars Stroemberg, Director of Development at Vattenfall estimates that approximately thirty to forty power plants in which electricity and heat can be produced simultaneously, and fifty new electrical power generating stations that rely on bio-fuel, would have to be built. In this way, the loss of nuclear energy would not be an insurmountable technical hurdle.

And the electricity rates. They will increase and in some regions, they will pose serious problems. Opinion polls show, however, that the Swedes are prepared to pay this price. The worry surrounding the terrible consequences of a nuclear power accident, and the political concern surrounding the atomic state, outweigh the economic disadvantages of retreating from nuclear power. The hopes that the brakes can be applied to this process, or that it might even be stopped altogether, have no chance whatsoever politically.

END OF FICHE

DATE FILMED

17 Jan. 1990